THE ENGINEERING AND MINING JOURNAL AND COAL.

(Published Every Saturday at 253 Broadway, New York.)
Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LXIII. JANUARY 23 No. 4

RICHARD P. ROTHWELL, C. E. M. E., Editor.
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SOPHIA BRAEUNLICH, Business Manager.
THE SCIENTIFIC PUBLISHING CO. Publishers.

Subscriptions are PAYABLE IN ADVANCE. For the United States, Mexico and Canada, $5 per annum; all other countries in the Postal Union, $7.
The address slip on the paper will show date of expiration of subscription. When change of address is desired both old and new address should be sent.
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Main Office: 253 Broadway (P. O. Box 1833), NEW YORK.
New York Cable Address—"ROTHWELL." (Use McNeill's or A B C 4th Edition Code.)
London Cable Address—"WELLROTH."

Branch Offices: **Chicago, Ill., Monadnock Building, Room 737.**
Denver, Colo., Boston Building, Room 206.
San Francisco, Cal., 12 Montgomery Street, Rooms 11 and 12.
London, Eng., E. Walker, Man'g., 20 Bucklersbury, Room 366.

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It is an encouraging sign that so important a company as the Lehigh Valley is considering the question of an independent audit of accounts; that is a periodical examination of its books by expert accountants or auditors who are not officers of the company. This is the system which has frequently been advocated in our columns, and it is undoubtedly a protection for stockholders which they should be very willing to adopt.

The Lehigh Valley Company also announces that it will hereafter take its stockholders into its confidence—though only to a limited extent—by publishing monthly a statement of the earnings of the railroad, and also of the operations of the coal company. This is not very much, but it is still a concession and shows that progress is possible—even with an anthracite coal road.

There are renewed rumors of negotiations for the purchase by the English syndicate of the remaining Haggin-Daly interest in the Anaconda mines in Montana. These rumors may be due simply to the known desire and even anxiety of Mr. Daly, at least, to sell, in order that he and Mr. Haggin may go on with the development of their Washoe Company enterprise, which is credited with possessing the elements of "another Anaconda." Mr. Daly has expressed his desires as to selling Anaconda in his usual emphatic language which may have some influence on the proposing purchasers.

We understand the next Anaconda statement will show even better results than the recent favorable report; this improvement in profits is no doubt due in great part to the close attention given to this enterprise by Mr. Hamilton Smith, of the Exploration Company, and is in line with the good results largely due to the same cause at the Alaska Treadwell mine which was brought out in London also by the Exploration Company.

The Poorman Gold Mines, Limited, in Idaho, with the past history of which readers of the *Engineering and Mining Journal* are familiar, has successfully gone through another reconstruction in London. It will be remembered that in 1895, after the Brotherton and Van Ee management had proved unsatisfactory, some of the leading shareholders determined to carry on the mine, and they expected that with honest management the shareholders would obtain some substantial results in the way of dividends. They therefore reconstructed the company and raised about $100,000 to continue work; but they soon found that the fault of the mine was not so much bad management as poor ore. In a year they had spent all the new capital simply in examining the various levels and finding out that none of them were worth working. They were, however, determined to thoroughly test the mine and to prospect in all directions on their claims, so that it became necessary to reconstruct again, and this was done during the latter three months of 1896. It is really surprising that the shareholders should be willing to put their hands in their pockets again, but as a matter of fact 19 out of 20 of them have done so. The company, of course, now becomes nothing but a prospecting syndicate, with practically no prospects; for if there were any indications of the existence of payable ore anywhere in the company's property, they would already, during the 30 years' existence of the mine, have been tested, and if worth anything, followed up.

In our issue of February 22d, 1896, we warned mining engineers against the "Institute of Civil and Mining Engineers" which had just been incorporated in London. Our readers will remember that this Institute was founded ostensibly for the purpose of putting the engineering profession on a safe foundation. We said at the time that the promoters were well-meaning nobodies and that there was no use for the Institute, and for these reasons we advised our readers to ignore it. The scheme evidently collapsed for the time, but now we have received another circular from the same parties announcing the formation of "The British Academy of Civil and Mining Engineers." The objects of this "Academy" are precisely the same as those of the defunct Institute. The number of well-meaning nobodies has materially increased and a new president has been secured. Of course this "British Academy" is open to precisely the same objections as the former Institute, so we must reiterate our advice to engineers to keep clear of it. Though we say that the promoters are well-meaning nobodies, we must make one notable exception, for among the directors is to be found the name of M. Berlyn Jacobs, Esq. If we mistake not, this gentleman is connected with a paper called *The Financial Who's Who* and he and two others have recently been committed for trial on a charge of blackmailing. Would not it have been better in the interests of the "British Academy" to have omitted this gentleman's name from the prospectus?

From time to time rumors are disseminated that Mr. Barnato is acquiring gold properties in Canada, both in British Columbia and in Ontario. Our London correspondent often expressed doubts as to the correctness of these reports, and considering the state of South African gold mining, it would be surprising if Mr. Barnato could find time to devote to launching out into new expenditure and the purchase of interests in a new gold-field.

It is, however, a fact that a good many circles of promoters in London have recently abandoned South Africa as a field of research and development and turned their attention to the Dominion of Canada. A recent example of this is the South African General Development Syndicate, which was formed originally to explore some of the properties belonging to the notorious Oceana Company. After continuing this work for a short time, the directors found that it was useless to pursue this line of exploration and decided instead to investigate the claims of the Lake of Woods district in Ontario. Last summer the directors inspected a gold mining property called the Mikado, about 33 miles south west of the town of Rat Portage, and, after satisfying themselves as to the value of the property, formed a subsidiary company called the Mikado Gold Mining Company. It is not necessary to go into details with regard to this property, as the only information available comes from the promoters, but we believe that very little cash has been spent on it, and that the product of the mine has met most of the expenditure so far made.

The Leadville situation seems just now to be worse than ever. In our news columns last week we noted the withdrawal of the pumps from several of the large mines, which was a practical expression of the mine owners' opinion that no settlement was to be looked for. This week the Governor of Colorado made a visit to Leadville in the hope of securing a settlement. He was accompanied by President Boyce, of the Western Federation of Miners and, unfortunately, by the discredited agitator Debs, whose part in the affair is not very clearly shown in the dispatches. Under the influence of Governor Adams the resident mine managers made a proposition agreeing that the rate of $2.50 per day now offered in the mines should be increased to $2.75 in all months when the price of silver should reach 70 cents per ounce, and to $3 when silver should reach 75 cents or over. They also agreed that men now receiving $3 per day should be retained at that rate. When this agreement was submitted to the Miners' Union, however, it was rejected by a large majority. The mine managers have refused to negotiate further, and it does not seem probable that they will agree to the arbitration which the Union proposes. The Governor has abandoned his attempt at conciliation as hopeless.

The situation at present is, therefore, that there is no prospect of an amicable settlement. The mine owners will either abandon the mines for the present, allowing them to fill up with water, or will continue the attempt to work as long as the State will bear the cost of military protection. What further steps the strikers can or will take cannot be predicted: but a renewed outbreak of violence is altogether possible.

The shipments of Lake Superior iron ore have now been made up for 1896, and the total reaches 9,934,446 tons, the official figures differing by only one-tenth of 1 per cent. from those given in our issue of January 2d, when some of the amounts were necessarily estimated. The extent of the Lake business is shown by the fact that shipments were made from no less than 84 mines, the quantity ranging from a hundred tons from some of the old mines up to 808,291 tons by the Oliver Iron Company. The official figures, as collected and published by the Cleveland *Iron Trade Review*, give the shipments by ranges as below, in long tons:

Range.	1895.	1896.	Changes.
Marquette	2,097,838	2,603,839	Inc. 506,001
Menominee	1,923,798	1,560,467	Dec. 363,331
Gogebic	2,547,976	1,799,971	Dec. 748,005
Vermilion	1 077,838	1,088,090	Inc. 10,252
Mesabi	2,781,587	2,882,079	Inc. 100.492
Total	10,4.9,037	9 934,446	Dec. 494,591

A total decrease of 5 per cent. is not a formidable one and is really less than might have been expected, especially when it is remembered that the accumulations on docks at Lake Erie ports are not unusually large. In shipments the old Marquette Range showed a large comparative gain, chiefly the result of short production in 1895, when the mines were closed by the strike during the busiest part of the season. The Menominee and Gogebic ranges lost heavily, while the newer Vermilion and Mesabi ranges about held their own.

Of the great quantity of ore reported only 290,410 tons went by rail from the shipping ports, less than 0.3 per cent. of the total. We have already noted the Oliver Iron Company on the Mesabi as the heaviest shipper, but six others exceeded 300,000 tons each for the year. These were the Minnesota and the Chandler mines on the Vermilion Range; the Norrie, on the Gogebic; the Chapin, on the Menominee; the Lake Superior and the Lake Angeline, on the Marquette Range.

The Lehigh Valley Coal Company.

The report of the Lehigh Valley Coal Company for 1896, an abstract of which is given on another page, is in some respects an example of what a report ought not to be. We have here a statement from a company whose shipments reach a total of over 5,000,000 tons of anthracite coal a year; but it gives no account of the prices obtained from these shipments, no statement of mining costs, and even omits the income account, which is usually considered an essential feature of a report. Some inferences may be drawn from the comparative balance sheets for two years; but we are not told what the actual expenses or even the earnings may have been. It is, perhaps, some advance to have any report at all; for some of the anthracite-carrying companies seem to consider it unnecessary to inform their stockholders as to the operations of the subsidiary companies in which they have such heavy investments, and upon which their prosperity so largely depends.

The first thing which we notice from the report is the statement that the company's coal property is not by any means worked up to its full capacity. The total shipments for 1896 are reported at 5,098,191 tons, of which 2,278,434 tons were from coal lands operated by tenants, leaving a total of 2,819,757 from the collieries operated by the company itself. The report, however, states the present capacity of those collieries at 17,966 tons per day of 10 hours, or 5,389,800 tons per year of 300 working days; that is, the company could double its shipments, or even, under pressure, go beyond that point. This fact, if fact it be, serves to explain some of the present conditions of the trade.

Although the shipments of coal made in 1896 decreased 385,859 tons from those of 1895, we find from the balance sheet that the value of coal unsold carried during the year increased by $1,300,000. That is, the actual sales and deliveries of coal must have fallen below those of 1895 by a large amount. This was probably due to the falling off in the Western coal trade, for the Lehigh Valley is a heavy shipper to the lakes and was one of the first of the anthracite companies to cultivate that market.

That the operations of the company did not result in a profit is shown by the balance sheet, in which the item of advances by the Lehigh Valley Railroad Company increased $1,862,397 during 1896; while we also find that the Railroad Company charges in its income account $590,650 as interest paid on guaranteed bonds of the coal company.

It must be remembered, however, that it is not at all possible to separate or adjust the earnings of the coal-producing companies under the present system. The railroad freights can be put at any point which is necessary to make the showing which may be desired. Thus coal, which is hauled long distances, and requires very little handling, should be considered a low-rate freight; but we find in the report of the Lehigh Valley Railroad that the average freight charge on coal last year was 0·646 cent per ton-mile, while that on miscellaneous freight was 0·48 cent; that is, the rate on coal, almost everywhere else the lowest, was greater by more than 50% than that on the general freight, reversing all the usual conditions.

The facts, or such of them as it is possible to glean from this imperfect and discouraging report, only serve to confirm once more the statement made in the article on "The Evolution of the Anthracite Coal Trade" in Volumn IV. of *The Mineral Industry*—that the anthracite coal trade has never been profitable to the producers, and that the companies in it which have survived have been those whose borrowing powers were exceptionally great. The fact that this company has done an unprofitable business during the year is, however, no excuse for the policy of secresy, which promotes extravagance and inspires in stockholders and capitalists a distrust of the whole management of a business, which they assume, often correctly, will not stand publicity.

Practical Aid to Scientific Progress.

The late Alfred Nobel, to whose genius and studies we owe the discoveries from which all the modern high explosives have come—discoveries which have done so much to aid the progress of the mining industry—succeeded in accumulating a large fortune. Unlike many inventors, he possessed the business sense, and was able to realize some part at least of the value of his inventions. A portion of this fortune he determined to devote to encouraging scientific work, and his will, according to accounts published in the Paris papers, disposes of an estate estimated at 55,000,000 francs, or $11,000,000. After making bequests of about $1,000,000 in all, to friends and relatives, the remainder is to be constituted a trust, the income from which is to be applied as follows:

"The income shall be divided into five equal parts, which will be awarded yearly:

"The first to the person who shall have made the most important discovery or invention in the domain of physics.

"The second to the person who shall have made the most important discovery or improvement in the domain of chemistry.

"The third to the person who shall have made the most important discovery in the domain of physiology or of medicine.

"The fourth to the person who shall have produced the greatest work in the ideal sense in the domain of letters.

"The fifth to the person who shall have exerted the greatest or the best action for the fraternity of peoples, for the suppression or diminution of permanent armies and for the formation or spreading of Peace Congresses.

"The first two prizes (Physics and Chemistry) shall be awarded by the Academy of Sciences of Sweden; that for physiological or medical works by the Carolus Institute of Stockholm; the literary prize by the Swedish Academy, and that for the spreading of peace by a committee of five members chosen by the Norwegian Storthing.

"It is my express will that no consideration of nationality should be taken into account in awarding these prizes, so that the most worthy may receive the reward whether he be a Scandinavian or no."

It is estimated that even at present low rates of interest the trust will bring these yearly prizes up to an amount of from $50,000 to $60,000 each; a sum surely sufficient to attract competition from those well qualified to deserve the prizes.

We have made especial mention of this Nobel bequest, because it presents in a general way an example worthy of imitation by our own rich men who wish to leave behind them an imperishable memorial, and who may be ambitious to aid in the progress and development of the country. It is an open question, however, whether the method adopted by the great inventor is that which will be best adapted to further his object. It is, of course, well that great rewards should be held out to stimulate the ambition of scientists and to draw out discoveries which may benefit mankind and aid in the progress of science and civilization.

It seems to us, however, that a much more practical way of aiding science has recently been adopted in England by Dr. Ludwig Mond, the eminent chemist and metallurgist, who, moreover, has not waited to make his gifts by will, but has founded an institution, the beginning and growth of which he can himself supervise. He has built, equipped and endowed an institution, to which he has given the name of the Davy-Faraday Research Laboratory, and which is the only one of its kind now in existence. This laboratory is intended for original research in pure science, especially chemistry and physics, and it contains very extensive suites of rooms for the various branches of these sciences, together with a library, mechanical shop, museum of apparatus, etc. The rooms are fitted up with the most modern appliances and apparatus, and the facilities for work are unrivaled. The only qualification required to become entitled to use the laboratory is that the applicant shall prove that he or she is able to conduct research work; and there is no restriction as to sex, nationality or previous training.

This, it seems to us, is a much more effective way of assisting scientific progress than the Nobel plan. The opportunity to conduct research with the aid of appliances very often out of the reach of the individual investigator, and with the best scientific advice and supervision, is almost an ideal condition for the student. Dr. Mond's plan is limited to investigations in pure science; but it would be very easy to extend the scope of such an institution to include researches in metallurgy and industrial chemistry, the results of which might and probably would be of great practical value. Only those who have been engaged in such work know how often they have obtained glimpses of possible discoveries, and have been forced by necessity, lack of means and the demands of daily work to postpone their experiments and investigations; too often, indeed, to abandon them altogether.

We have in this country certain natural advantages which ought to give us the leadership of the industrial world. Abundant supplies of fuel and raw material, water powers, transportation systems making almost all parts of the country accessible, enterprise and capital are to be found here. That we have not yet attained to such leadership is due partly to the fact that we have not yet learned to overcome the wasteful habits which grew up in earlier practice, and partly because we have not yet fully learned the value of scientific work. Our coke ovens and blast furnaces are throwing away daily the by-products which in Germany and Belgium are making, to many establishments working under the sharpest competition, all the difference between a profit and a loss. Our unrivaled opportunities for the successful extension of the chemical industries are not utilized. In other directions we are not making the advance which we ought to record, and the reasons are easily understood.

One method of overcoming our present disadvantages we have already outlined. We repeat that there is no greater public benefit which some of our rich men could confer than the establishment of research laboratories on a practical basis, to aid and supplement the work which the technical schools are doing. They should be open to all, especially, perhaps, to those who have learned in the hard school of experience, and are better able to appreciate industrial necessities than those whose training has been scientific only.

Another method, to which we have heretofore referred, is in the modification of our educational systems, making them more practical, and giving the student better opportunities to fit himself for future work. This is, however, properly a subject by itself, to which we hope to refer again hereafter.

NEW PUBLICATIONS.

MAP OF THE MINERAL DISTRICT OF NORTHERN MICHIGAN. Compiled and drawn by H. M. Edwards. Calumet, Mich.; published by H. M. Edwards.

This is an excellent example of map making and gives on a sheet 54 × 80 in. a very complete map of one of the most remarkable mineral regions in this country, or perhaps in the world. It shows the greater part of the Northern Peninsula of Michigan, including the copper country in Keweenaw, Houghton and Ontonagon Counties and the Marquette, Menominee and Gogebic iron ranges. Appropriate tints are used to distinguish the different formations and they are readily picked out by the eye. The scale is large enough to permit the locations of the different mines to be given and the extent of each company's property to be clearly defined; while the railroad land grants and the holdings of the different land companies are also shown.

The map is, of course, based on the surveys and township divisions of the government survey; but a very large amount of work has been added to show the various points referred to above, besides others which are included. The engineer who has such a map to guide him is very fortunate, and there are few mining districts in the United States where so complete a chart is to be had. We need hardly add that the streams and water-courses, the roads and railroads are fully shown, since these are essentials of such a map.

FUEL AND REFRACTORY MATERIALS. By A. Humboldt Sexton. London, England; Blackie & Son, Limited. Pages, 352; illustrated. Price (in New York), $1.75.

This book was prepared, according to the author, partly as a text-book for students, and partly for the use of engineers who might need some book of reference less elaborate than those of Percy, Mills and others. Some idea of its scope may be given by saying that its chapters treat in succession of combustion generally; of the different kinds of solid fuels; of liquid and gaseous fuels; of by-products of furnaces; of metallurgical furnaces; of pyrometry and calometry; of tests of fuels, and finally of refractory materials.

A book of this kind is necessarily in large part a compilation; and the author has brought together his materials very carefully, generally giving credit to the sources from which he has obtained them. His descriptions and illustrations are drawn chiefly from British practice, and he has gone very little outside of that, though in the chapter on metallurgical furnaces we find a lead blast furnace from Professor Hofman's work. Very little reference is made to American practice elsewhere, and the blast furnaces, steel furnaces and others described are nearly all British or French. In all his calculations he has used the British thermal unit, though in many of them the Centigrade equivalent is noted also.

Considerable stress is laid upon the saving of by-products, especially in the preparation of coke. The Scotch practice of saving by-products from the blast-furnace gases is also described. The chapter on gas fuel is quite full, the principal attention being devoted to the Siemens, Thwaite and Howson producers. Only slight mention is made of the Taylor gas producer, so successfully used here. The subject of liquid fuels is very briefly discussed, a good deal more being said about the origin of petroleum than about actual experience with it in the furnace.

There are some rather curious omissions; for instance, in a diagram showing the coal areas of different countries, no mention whatever is made of Germany, though its production is so large and important, especially to Great Britain, which is just now being pushed so hard by German competition.

With due allowances, the book is a very useful text-book and may be a convenient addition to the engineer's library. It would be very much improved for our use, however, by the addition of a chapter or chapters on American practice and experience.

BOOKS RECEIVED

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review on another page of the Journal.

Reports of the Commissioner of Education for the year 1894-95. *Volume II. containing parts II. and III.* Washington, D. C., Government Printing Office, 1896. Pages, 2,314.

Reports of the United States Commissioner of Fish and Fisheries. Parts XIX, and XX. for the years ending June 30, 1893, *and June* 30, 1864. Washington, D. C.; Government Printing Office, 1896. Pages, 484 and 718, respectively; with illustration.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested. Letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

Electric Smelting.

Sir: The writer would be glad if any of your readers could give him information as to progress up to date in the smelting by electricity of pyritic gold ores. ENQUIRER.

Magnetic Carbide of Iron.

Sir: I have been requested at various times to quote for magnetic carbide of iron, which, I understand, is being manufactured in the United States. Can one of your readers quote with all particulars as to packing, percentage, etc., at American or European port, or give the address of reliable makers? E. DE HAEN.

HANOVER, Germany, Dec. 23, 1896.

Argentiferous Zinc Lead Ores.

Sir: From special articles in *The Mineral Industry* and from technical articles that have appeared from time to time in the *Journal*, metallurgists are under the impression that argentiferous zinc lead ores are exceedingly abundant throughout the western country. An examination of the sources of supply of such ores has caused me to conclude that while the ores may be abundant it is still somewhat difficult to locate sources where the supply is in shape to be easily obtained in sufficient quantities. The ore needed should contain from 20 to 25% lead, the same

amount of zinc and from 12 to 15 oz. of silver. Can you or your readers indicate any other sources of supply besides Aspen and other districts in Colorado? B.

PHILADELPHIA, Jan. 6, 1897.

The Mineral Wealth of Georgia.

Sir: Attention has never been called to the fact that, besides gold, silver, copper and iron, valuable gems have been found in Georgia. The amethyst, the beryl, the topaz, the diamond and other gems are found in different localities. In the gold placers of White, Habersham, Banks and Hall counties, we find the diamond. The itacolumite or flexible sandstone, matrix of the diamond, extends through Hall County for 30 miles, and in some streams washed for gold diamonds were found. Only those without incrustation were picked up, through the ignorance of the washers, and the crusted ones were thrown away. At the Marchbanks diamond mine, 4 miles northeast of Gainsville, seven diamonds have been found; notwithstanding they have only sunk a shaft upon the itacolumite dyke, about 12 ft. deep.

There are many gold and other properties here that can be had far below their intrinsic values; were the same located in the West they would be estimated at their worth, but the crude methods of mining they have here and the inability to save the gold, is detrimental to the progress of the mining industry of this State. I could name one mine now working by the hydraulic system and running the dirt through a stamp mill, that is only saving 20% of the gold. The natural resources of Georgia in timber and water for mining purposes are inexhaustible. The salubrity of its climate, its advantages in railroad facilities, its close proximity to markets, the cheapness of labor (the best miners only getting $1.50 per day), all tend to the advantage of the mine investor. GEORGE BELMONT.

DAHLONEGA, Ga., Jan. 1, 1897.

THE AMERICAN SOCIETY OF CIVIL ENGINEERS.

The forty-fourth annual meeting of the American Society of Civil Engineers was opened in New York, January 20th. The society was called to order by the President, Thomas Curtis Clarke, and the minutes of the meeting of January, 1896, were read by the secretary, Charles Warren Hunt. This was followed by the secretary's reading of the annual report of the board of direction. The report showed that the net increase in membership during the year was 98. The total number of applications considered by the board was 206: action was taken on 190 and 58 were awaiting action. The sum of $70.60 was spent upon the library. Bound volumes to the number of 188 and 269 unbound volumes were added, and the total additions were 1,078. The present number of titles in the library was 20,741.

The report says, in conclusion: "During the year an earnest effort was made to secure sketches of the lives of deceased members of whom no memoir had been published. In many instances this was found very difficult, but since January 1st, 1896, 54 memoirs have been published, of which 44 were of men whose death occurred before that date. Many other memorial notices are in various stages of preparation, and it is hoped in the near future the list of these publications will be complete. It has been decided that hereafter all memoirs will be published in *Proceedings*, and also subsequently reproduced in the volumes of *Transactions*."

The report of the treasurer, John Thomson, showed that the expenditures for the year were $56,669, leaving a balance on hand of $11,455. The surplus of the society for the current year has materially increased, and the financial affairs of the society are on a satisfactory basis.

The board of censors to award the Norman medal for papers published during the year ending August 1st, 1896, reported that the award had been made to J. E. Greiner, engineer of bridges of the Baltimore & Ohio Railway Company, for a paper entitled, "What is the Life of an Iron Railroad Bridge?" The board was composed of W. G. Curtis, of San Francisco; Alfred P. Boller, of New York, and Capt. Thomas W. Symons, U. S. Engineers.

The committee on the award of the Rowland prize reported that the successful contestant had been Henry St. Leger Coppee, of Greenville, Miss., for a paper entitled "Bank Revetment on the Lower Mississippi." The committee was composed of John F. Wallace, of Chicago; Howard A. Carson, of Boston, and Charles W. Hunt, of New York.

A proposal to appoint a committee to report on new testing methods for cement came up again, and will now be referred to a letter ballot of the society.

At twelve o'clock the result of the balloting for officers was announced. The following were elected: President, Benjamin Morgan Harrod, New Orleans. Vice-presidents, to serve two years, George Henry Mendell, San Francisco; John Findley Wallace, Chicago. Treasurer, John Thomson, New York. Directors, to serve three years, Rudolph Herin, New York; James Owen, Newark, N. J.; Henry Grant Morse, Wilmington, Del.; Benjamin Lincoln Crosby, St. Louis; Henry Stevens Haines, Atlanta, Ga.; Lorenzo M. Johnson, Eagle Pass, Tex.

In vacating the chair, Mr. Clarke said that he "left the society in excellent condition, having no domestic and no foreign foes, as the President of the United States might say." Major Harrod then took the chair, and after expressing thanks for the honor done him, made pledges to devote himself to the best of all his powers to the just and impartial discharge of the duties of his office.

In the evening the Secretary, Mr. Hunt, read to the society a sketch of the history which he has prepared of the organization. This sketch has been printed by order of the board of direction, and will be ready for delivery early in February. Few members know much of the origin and growth of the organization and there is little accessible information concerning its early history. The meager official records have been amplified by material gathered by investigations in early technical literature and correspondence with members of the society who took an active part in its establisment or in its reorganization. To the facts thus gathered has been added a summary of the more recent development and work of the society, with a table of its yearly membership, and a diagram showing its growth as compared with that of other leading national societies. The volume will be illustrated with a nearly complete set of portraits of officers of the society, has been printed and bound in the best manner, and will be sold only on subscription at $10 per copy. At this price there will be a handsome profit to the society, which will be devoted entirely to the new Society House fund, as the publication is intended to provide a way by which every person connected with the society may make a small contribution to the new building and at the same time obtain a volume which it is believed will prove of great interest to him as an engineer.

On Thursday, January 24th, the members visited the new Croton Dam, inspecting that and other works in connection with the improvement of the New York City water supply, at the invitation and under the direction of Mr. A. Fteley, the chief engineer of the Aqueduct Commission. In the evening there was a reception and supper at the Hotel Waldorf, which was largely attended.

PLATINUM IN RUSSIA.

The production of platinum in Russia continues to be almost entirely from the placers of the Oural. The quantity reported to the Imperial authorities for six years past has been as follows, in kilogrammes:

	Kilos.		Kilos.		Kilos.
1890	2,841	1892	4,573	1894	5,208
1891	4,236	1893	5,100	1895	4,416

The production increased steadily until 1894, but in 1895 there was a considerable decrease. For 1896 the output is estimated at 4,800 kg. It is believed that real production is above that reported, the miners themselves stealing a part, while another part is concealed to avoid the payment of tax. Some authorities estimate that 25%, at least, should be added to the official statement. This would make the total 5,500 kg. in 1895 and 6,000 kg. in 1896.

The crude platinum obtained is not refined in Russia, as a rule, most of it being sent to Germany for that purpose.

Iridium is found in connection with the platinum. The quantity obtained in 1895 was 4,100 kg., and for 1896 it is estimated that a total 4,250 kg. was produced.

CLASSIFYING TAILINGS BEFORE CONCENTRATION.

Messrs. W. Bettel and J. H. Johns have been carrying on at the Ferreira mill some novel experiments on behalf of the Chamber of Mines, Johannesberg, says the *South African Mining Journal*. It was believed that better results could be got by classifying the pulp previous to concentration, but the anticipations were not realized. The experiments were in the direction of roughly classifying by means of spitzluten and spitzkasten, and of passing that pulp alone which came from the spitzluten over the vanners. It was found that under these conditions the vanners have not caught their usual percentage of metal.

The explanation offered may be thus summarized: 1. Overloading. 2. To a principle which has hitherto not been recognized on these fields, but is well known on the diamond fields, that minute particles of high specific gravity will subside through a shallower layer of pulp suspended by agitation in a turbid medium (such as a mixture of coarse and fine sand, pyrites and clay) more readily than through a classified pulp, consisting of coarse particles suspended in clear water. This may be explained by assuming a reduction of surface tension in the former case. 3. The proportion of fine gold escaping in sands and slimes is increased when an excess of water (over normal) is present in the pulp. 4. With spitzluten, an increased clear water supply carries off fine gold and floured amalgam in considerable amounts in slime pulp. 5. The scouring action of the coarse sands, etc., from the spitzluten (free from slimes) prevents the collection of floured amalgam on the shaking amalgamated plates on the vanners, and this amalgam so lost is not wholly recovered in the concentrates collected.

The pulp (consisting of slime and finest sands) delivered by the spitzkasten is only imperfectly concentrated on the third vanner, such pulp requiring a large area equal to a very shallow layer of liquid for efficient concentration. The finest slimes (solid matter in effluent from spitzkasten) are very rich in gold; this is attributed to the presence of suspended floured amalgam and free gold of extreme tenuity, probably coated with films of grease or sulphides, which cause the particles to exert an increased surface tension sufficient to overcome the action of gravity to a very considerable extent.

The results obtained are, however, extremely interesting, and may, under other circumstances, have a distinct commercial value. When Frue vanners are used for concentration, previous classification in the opinion of the experimenters would not be advantageous, but where any other concentrator, not having a vanning motion, is employed, they would recommend a previous classification of the battery pulp.

Lithium Nitride.—Owing to the fact that lithium is the only substance with which nitrogen will directly combine at ordinary temperature, says *Nature*, considerable interest attaches to the properties of the compound thus formed, lithium nitride. This compound, as M. Guntz showed some months since, is easily prepared by the combustion of lithium in nitrogen gas, and the specimen thus obtained was regarded as pure, since the nitrogen absorbed corresponded almost exactly with that required by the formula Li_3N. But in spite of this confidence M. Guntz now shows that the product is not pure, as at the moment of combination the lithium attacks the boat in which it is held, although it is difficult to say exactly in what form the metal goes into solution in the molten nitride. Thus working with iron boats, the nitride contained from 2 to 8% of iron, and nickel is even more strongly attacked. Silver, platinum, quartz and graphitic carbon were all tried and found to be even less suitable than iron. Measurements of the molecular heat of formation of the nitride gave a value of 49·5 calories, or less than the value for the equivalent quantity of lithium hydride (65 calories). From this the conclusion was drawn that hydrogen ought to decompose the nitride of lithium with formation of the hydride, and this was found to be the case. The reaction, however, can be reversed, since at a high temperature a stream of nitrogen converts the hydride into the nitride.

PRACTICAL NOTES ON FURNACE CONSTRUCTION AND MANAGEMENT.—I.

Written for the Engineering and Mining Journal by Herbert Lang.

My intention is to write a series of letters upon what I may call the every-day aspects of smelting and of other branches of metal production, but especially smelting, which has been for some years my chosen field. There are a large number of topics connected therewith which have not received adequate treatment either in books or in less pretentious essays. They are such subjects as are frequently studied or discussed by metallurgists, and I shall discuss some of them in an informal way, not expecting either to cover the whole ground of smelting, or to say the last word upon any subject. In fact, my object is more to elicit discussion upon interesting and especially upon unsettled matters than to attempt to settle even the simplest one. Truth is to be arrived at by a comparison of opinions rather than by the bare assertion of anyone. I shall be much pleased if anything that I may say will lead to another of those interesting and valuable discussions, such as have frequently appeared in the *Journal*, with the result of settling important and more or less disputed points.

FURNACE CONSTRUCTION.

Concerning blast furnaces a division of opinion has long existed as to the materials of which it is proper to make their walls; some preferring brick or stone, others water-cooled surfaces of iron. The dispute is as acute now as it ever was, but I think I perceive signs of yielding among the water-jacket men, who until lately have contended that nothing else was suitable for the purpose. I do not at this moment call to mind any custom, well founded or not, which has so stoutly held sway among designers as the present fad for water-jackets. I have often put the query to its admirers, what is the water-jacket for, and what function, mysterious or otherwise, does it fulfill? Is it intended to have any other influence upon the process than to restrain the corrosion of the walls? And is not corrosion, even in immense iron furnaces, so restrained without it that campaigns of years are made without difficulty? These are questions which the advocates of the water-jacket find it hard to answer. On the other hand I feel that the brick stack, pure and simple, is a nuisance that only a misplaced deference to antique practice allows to exist.

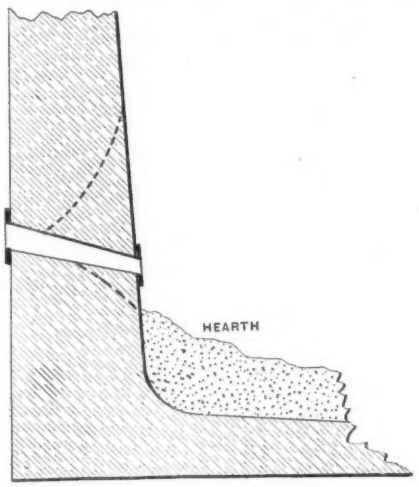


FIG. 1.

Fig. 1 shows a section of one wall of the brick furnace pure and simple, and without any attempt at water protection. The dotted lines show the erosion resulting from a smelting campaign, the lines being somewhat conventionalized or smoothed down, as it were. The tuyere, which is a simple pipe, is slowly burned off at the inner end, letting the blast play closer and closer to the wall, and causing the smelting to go on intensely there, cutting away the surfaces and drawing the center of activity of the tuyere further and further back toward the outside of the structure, until finally the wall is eaten almost or quite through close around the tuyere, which continues playing, when a hole is made quite into the furnace, and a season follows, usually short, of active mud-throwing, with the design of healing momentarily the breach thus made; but the campaign cannot last much longer. Furnaces of this kind usually have very large tuyeres, up to 6 in. in diameter, a supposed virtue, and the excessive quantity of wind thus concentrated in one spot helps to cut them out more rapidly than would otherwise be the case. As the tuyeres burn back, the tendency is for each wind-stream to act separately, creating a sort of crater of its own, which in a little time becomes almost or quite separated from the others, and carries on smelting independently. Thus we may have several virtually independent centers of smelting in one furnace, not at all to the benefit of the process. As a necessary result large areas of the hearth refuse to work at all, and smelting over a good proportion of it ceases, the solid materials lying there inert, and not to be brought again into action. I have seen as much as 10 tons of such material shoveled out of a furnace at the conclusion of a campaign which had been brought to an end in this way, everything first being blown out that would melt. When the utmost efforts of a crew of active mud-slingers cannot keep the flames from breaking through the sides, it is time to quit and take off the blast. Some quit sooner, fearing that the whole furnace will tumble down. In a furnace cut out in this way I once measured the distance between the mouths of two opposite tuyeres and found that it was 8 ft. Of course such attempts at smelting are absurd.

The brick stack, pure and simple, marks one extreme, the high water-jacketed shaft the other. In one we depend wholly upon the heat-resisting virtues of fire-brick, in the other wholly on the heat-absorbing capacity of water. The one keeps the heat on the inside of the shaft where it ought to be, as long as it lasts; the other never wears out, but carries away a good deal of heat in the water. I do not complain of those who make use of water-jackets; I only contend that some of them overdo the thing and carry the principle to an extent at which reason and common sense revolt. When you find a man building his furnace of fire-bricks "straight" and using no cooling appliances, you may know that he is the inheritor of old traditions, the victim of antique malpractice. When he builds his furnace jacketed clear to the feed-floor, and what is worse, jackets even the fore-hearth, you may be certain that he sees more in the water-jacket than a mere cooling and protecting device. It appears to me that as the only discoverable function of water-cooled surfaces is to prevent corrosion, there is no utility in extending the water-cooling beyond the parts which are actually subject to corrosion. These parts are the walls immediately above the tuyeres, and extending perhaps from 3 to 6 ft. above them in low blast furnaces, but a great deal higher in the iron furnace, where corrosion takes place some 20 ft. from the hearth at times. In the hot-blast pyritic stack the zone of fusion is very low, the smelting and consequently the corrosion not extending more than 2 or 3 ft. above the tuyeres. The charge in certain furnaces of this sort is not more than 3½ ft. deep, and it is very easy to see that the wear upon the walls would be limited by the depth, this following to some extent from the direction which the hot gases are compelled to take in escaping from the charge. Of course, the brick walls are hot to a considerable depth while work is going on, but the hot zone is very circumscribed indeed.

There are four ways to rectify the tendency to corrosion, namely:

1. Substitute chemically inert or less fusible substances for the fire-brick composing the wall.
2. Cool the wall with irrigating pipes buried in the mass of brick-work.
3. Use water tuyeres, which will prevent destruction, and by keeping the blast away from the walls prevent their injury.
4. Water-jacket the surface exposed to wear.

All our care may be bestowed upon the limited surface immediately around and just above the tuyeres, for the remainder of the furnace will take care of itself. Either the second, third or fourth plans will answer fully, while the first has never, to my knowledge, been tried in blast furnaces; but as it has long been in use in open-hearths where the conditions are not very dissimilar to those prevailing in some blast furnaces, there would seem to be ample warrant for trying it in the latter. The general principle that basic linings best resist the action of basic slags and acid linings, acid slags will undoubtedly hold as good in blast-furnace work as in the reverberatory, where they have been established for some years. I believe that magnesian linings will find their place in the sides of cupolas and that they will prove of utility whenever the conditions favor their employment. Neutral linings, I believe, will find a larger use; and, in this connection, I would mention chrome iron ore as a promising substance for the purpose. As the reader is doubtless aware, this substance has been suggested for open-hearth steel work; though I am not aware of its actual use therein. But Mr. Ropp, of the Selby Smelting and Lead Company, has used it quite extensively in the matting reverberatories of the company at Vallejo Junction, Cal., and with exceedingly gratifying results. The hearth is composed of large fragments of chrome ore, with the interstices well filled with smaller pieces, and the material is built up around the sides to the slag line, and the amount of protection is such that fettling is almost done away with; in fact, they have to fettle but once in a week or so. The chrome ore is acted upon slightly, if at all, and thus furnishes the very best lining. The slags are quite basic, iron being the principal base, and gave a vast deal of trouble when run with silica linings, which were cut through very quickly indeed. So favorable is the behavior of magnesia that it well may play an important part in smelting in the reverberatory, and as far as I can see it will prove as useful in the cupola. There is, however, a sensible difference in the two furnaces as regards the cause of corrosion. In the blast furnace there are two active causes—the slagging effect of the charge, which cuts away the wall by its chemical properties, and the mechanical effect of the blast, which scores the interior surfaces. The blast, entering by the tuyere, does not maintain its primary direction a moment, but is diverted at high angles, and finds its way out of the furnace by the interstitial passages, describing exceedingly tortuous and broken lines. Some of the streams into which it is broken impinge very likely upon the walls, and the air has very probably been heated to a white heat, sufficient for fusing the materials before it, and to soften the fire-bricks themselves. The whole mass of brick may also be red-hot for a foot or more inward, and in good condition to be acted upon either by the hot air or the molten slag which finds its way down the face of the brickwork. Hot slag itself brought into contact with the brick will undoubtedly flux them to some extent, depending upon their chemical composition. This is shown occasionally by the cutting out of the crucible, but outside of this fluxing property, which would be very slight, except where smelting is actively going on, there will be no corrosion where the blast does not strike.

That portion of the wind which finds its way up along the walls will do the most mischief, affecting them both mechanically and chemically. If now we arrange to divert the wind from the vicinity of the walls we have done all that is needful to protect the furnace, which will last indefinitely with such precautions. We can do this by cultivating a nose of cold slag on the tuyere, lengthening it to the required extent, or we can provide water tuyeres, which will retain an invariable position, in front of or even with the face of the wall, and prevent destructive action for the most part. Of course we do not worry about slight cutting, for holes of a foot or so in depth do not affect the work at all, provided the wind continues to be introduced at the original locality, the tuyeres being unaffected. The constantly changing conditions in the interior cause a good deal of unimportant cutting away and an equal amount of subsequent filling up, which balance each other and do no harm. The charge is denser down toward the hearth, and the hot wind streams are thrown with more force against the walls and the slag is forming there, with a possibility of its reacting upon the bricks. Above this zone and toward the top of the charge the air has become cooled, the solid matters

of the latter charges having abstracted its heat: it proceeds with far less velocity, and finally fusion of the charge has not set in. The result of these conditions is that no injury to the walls is to be apprehended in the upper parts of the shaft. What then is the use of jacketing a shaft to the top? Is it not enough if we protect in an appropriate manner the surfaces as far as they are subject to injury? While I believe that these questions admit of but one answer, I shall not neglect to call the reader's attention to the fact that while it is a useless waste of material to jacket the upper part of the shaft, the superfluous jackets will not cause a very great loss of heat, because the temperature there is not very high.

[We hope metallurgists will discuss Mr. Lang's notes that the greatest possible amount of experience may be drawn out.—ED. E. & M. J.]

THE GOLD PLACERS OF SIBERIA.

By E. D. Levat.

In his report on the gold mines of Eastern Siberia, Mr. Levat says that the first point which strikes one on examining the map of the gold-bearing deposits of Siberia is the wide diffusion of the auriferous placers over the surface of this great country. They are not, however, scattered in a uniform manner. The importance of Eastern Siberia as a producer of gold reaches fully one-half that of the whole Russian Empire, but from a geological point of view the phenomena of the occurrence of gold appear more or less all over Siberia. If we start from the gold-bearing deposits of the Oural, the earliest worked, or as one might say the cradle of the mineral industry of the country, we find an uninterrupted series of gold-bearing deposits as we go eastward. The Orenbourg Steppes form the continuation of the Oural; then comes the Semipalatinsk region upon the Upper Irtish where the number of placers worked is increasing very rapidly. Southward from this region extend the placers partly prospected, in the neighborhood of Verna, or further yet those east of Tashkent, which show that the gold-bearing formation extends over the great extent of country in Central Asia, which has more recently passed under Russian control. To the eastward again we find the important mining districts of Central Siberia in the basins of the Obi, the Tom and the Yenissei, the latter including two groups, that to the southward of Krasnoiarsk and the valleys of the middle and upper Tongouska. Crossing Lake Baikal, we enter to the north the basin of the Lena with the rich placers of the Olekma and the Vitim. To the south, in the Transbaikal, are the districts of the Onon, the Oud and the Chilka. Finally to the east in the Amour Basin we find the placers on that river with its affluents the Zeya, the Boureya, the Oussouri and the Amgoun.

All over this region for more than 7,000 versts the gold-bearing placers are remarkably uniform. They are found in the ancient formations, schists, mica-schists, eruptive and crystalline rocks, showing that their origin may be attributed to the Azoic period or at least to the Silurian epoch. On the other hand, if the origin of the gold can be traced back to this early period the formation of the placers is recent, and the secondary deposits have been made at a time when the river valleys and, in fact, the general orography of the country differed very little from that of to-day. In these alluviums we still find the remains of the mammoth, the rhinoceros and other animals which would place them in the Post-Tertiary period. From this it results that the Siberian deposits are found at the bottom of the present river valleys, having usually little longitudinal fall, and covered only by recent earth and turf resulting from vegetable decay.

These characteristics clearly differentiate the Siberian deposits from the Miocene placers of California, which were formed under an orographic regime so different from that of the present day that in many cases the old gold-bearing river beds are not only above the present valleys but are even cut by them at a right angle. It would be an interesting study to see if this remarkable similarity in the constitution of the Siberian placers does not correspond to uniformity in their origin, or at least to the existence of general causes common to all of them.

It is perhaps too early to undertake a study of this kind because the materials for it are still somewhat limited, especially in the Transbaikal. Although many placers have been worked in that region there are very few where anything more has been done than simple stripping and opening sufficiently to prospect or work the deposits. No exploration has been made for mineral-bearing veins and no attempt made to arrive at the origin of the placers. Only two stamp-mills exist in all the Transbaikal, and only in one place is there any attempt at deep mining.

In the Oural, where working has been continued for many years, the formations are well understood. In that region the formation is composed of chloritic, argillaceous and talcose schists, traversed by veins of eruptive rock, locally called berezite, which is, in fact, a granite from which the feldspar has disappeared, leaving in the remaining rock as constituent elements, quartz and white mica. These veins of berezite vary in width from 4 up to 40 meters. They are in turn divided by numerous small veins of quartz averaging perhaps 5 cm. in thickness. These veins are generally distributed in groups separated by greater or less intervals, and their direction is usually almost perpendicular to that of the veins of berezite.

All these quartz veins carry some gold. It is accompanied by pyrites and by the ferruginous ocher and the brown hematite resulting from the decomposition of the pyrites. Gold is scattered through the mass of quartz and in the hematite, but is rarely found with the other minerals in the veins, which are numerous, such as chalcopyrite, galena, etc.

The berezite and sometimes the surrounding schists carry also some gold in such a way that it would seem as if the quartz veins had concentrated the metal which originally impregnated the whole mass of rock. The deposits of this nature, that is where the gold is disseminated through the gangue or mother rock, have been explored to some extent, but generally they do not carry gold enough to warrant working them. Thus the berezites of the Ouspien and Kionetzeff mines carry only about 2·36 gr. of gold to the ton. The microgranulites of Pisminskagora vary from 0·65 gr. up to 10 gr. per ton, while the serpentine gangue varies from 1·30 gr. to 2·30 gr.

We shall see that a rock similar to berezite—that is, a rock derived from the original granite by the disappearance of one of its elements—is everywhere a mineral-bearing rock, like the berezites of the Oural. This rock is aplite, that is, granite without mica. The description of the veins found in this rock are almost exactly the same as that of the quartz veins in the berezite, with this difference only, that the mineralizing action in Eastern Siberia has apparently been much stronger than in the Oural, and that the veins of gold-bearing quartz reach an average thickness of at least an archine (0·71 m.) instead of 5 cm.

As to the gold in the aplite, I made a very interesting study on specimens of this rock heavily charged with pyrites taken from the mine of Baian-Zourga in the Onon group. In this case there were 5 kg.—0.5%—of pyrites to the ton. The quantity of gold to the ton was 0.50 gr.

The presence of gold in the aplite and the berezite, both rocks derived from granite by the absence of one of its constituent elements and indicating in consequence the end of the eruptive period, permits us to believe that the gold was deposited at the same time with these rocks, and probably in a state of combination with iron pyrites. It was set free near the summit of the vein when the iron was converted into an oxide, and was concentrated with the silica in the crevices due to the cooling of the heating mass, as well as in those produced in the surrounding schists in the breaking up following the eruption of the igneous mass.

This cooling should, in fact, have affected equally the surrounding schists which must have been highly heated and metamorphosed by contact with the eruptive rocks. It produced in them crevices which have also been filled with gold-bearing quartz. This would explain the number of quartz veins which are observed in the schists. According to the theory which I have outlined, these veins are not necessarily continuations of those found in the mother rock. The vein filling is similar, but the causes of the formation are different. This is everywhere shown by observation.

Several facts serve to confirm this description of the origin of the gold-bearing formation in Siberia. The first is the decrease of richness in depth which has followed in almost all mining in the Oural, and which we have to expect in Eastern Siberia. This theory would seem to prove that we shall not find free gold below the line where the iron has been transformed into oxide; consequently it will be necessary to provide machinery and methods for treating ores carrying gold in combination with the pyrites whenever we pass below the line of oxidation.

We may say in conclusion that aplite is frequently found, especially in the vicinity of the quartz veins, as an altered rock transformed into a characteristic clayey mass, white or reddish in color. Elsewhere the rock, having preserved its hardness, has nevertheless lost a notable portion of the silica which it contains. Cracks, sometimes filled by ferruginous ocher, show the decomposition of the iron pyrites and the formation of a brown hematite which in its turn has disappeared.

I hope that I have clearly shown the important part played by the phenomena of concentration posterior to the formation in the Siberian gold bearing formations. Whether we talk of pseudo-granitic rocks such as aplite and berezite, or of more basic rocks, porphyrys and serpentines, the phenomena of the appearance of gold remain the same. The precious metal appears to have come at the same period as the eruption of these rocks, in combination with iron pyrites or according to more recent researches with silica itself, and it has been deposited by segregation in the cracks and crevices caused by the natural shrinking of the heated mass, or in those produced in the surrounding rocks by the disturbances which followed the eruption.

Hollow Forged Steel Shafts.—The Bethlehem Iron Company has recently begun to introduce hollow forged steel shafts on the Mississippi and Ohio rivers for stern-wheel steamers. A late contract with the Pittsburg & Cincinnati Packet Line, of Cincinnati, was for a hollow forged nickel-steel, oil-tempered shaft, 38 ft. 9 in. long, 14 in. outside diameter, with a 7-in. hole through it. Such a shaft is claimed to be 3,500 lbs. lighter and 3½ times stronger than the solid wrought iron shaft which ordinarily would be placed in such a boat. Several other shafts of the same kind have recently been made. In a paper recently read before the Western Society of Engineers, by Mr. H. F. J. Porter, General Western Agent of the Bethlehem Iron Company, he said that as compared with a wrought iron shaft 14 in. in diameter and 30 ft. long, whose strength would be taken as unity, a solid steel shaft would be one-third stronger. A solid nickel-steel shaft would be 1½ times stronger. A steel shaft of the same outside diameter with a 3½-in. hole through it and oil-tempered would be twice as strong. A hollow nickel-steel shaft of the same type would be three times as strong. A hollow forged steel shaft of the same weight but of 22 in. outside diameter and with a 17-in. hole through it would be three times as strong, and if oil-tempered 4½ times as strong. If made of nickel-steel it would be six times and if oil-tempered eight times as strong.

Coal in Upper India.—A correspondent of the London *Engineer* says that the geological formation of many of the districts of Upper India leads men of experience to believe that coal is to be found there in large quantities. Some experiments have already been made in one or two of the upper provinces, with varying success. A shaft was sunk a few miles from Cashmere, but this was ultimately abandoned, as the coal extracted was found to be of very poor quality. A move was then made further west, and another shaft was sunk, from which a considerable quantity of coal has been taken. This has been found to be of very fair quality, though not equal to that turned out from the collieries of Karharbari and Serampore, which produce the best coal yet discovered in India. No serious attempt has yet been made to work the Cashmere coalfields with profitable results, but this is only a question of time. Two shafts are at present being worked at Peshawar. Nearly 400 tons was the output of these two shafts in one week, and this output can be steadily increased. About 150 native hands are now employed at these workings, and they prove themselves very efficient colliers. There is any amount of native labor available in Upper India. Another shaft in Peshawar has been sunk at no great distance from the others, from which coal of better quality has been taken, and it is proposed to test for still deeper seams of coal, for which purpose a diamond drill, capable of penetrating to a depth of 1,500 feet, has been introduced.

MINE VENTILATION IN GERMANY.

Recent discussion on different systems of mine ventilation in Germany is briefly summed up in *Kuhlow's*. The advocates of separate ventilation—as practiced in the Saarbruck coal pits—claim that it offers a greater degree of security to the miners in fiery pits than is afforded by the usual system, but this is doubtful in the case of single headings driven to a considerable distance from the main air current and ventilated by means of small motors worked at high speed, and, therefore, particularly liable to damage in the wearing parts. It is not, however, contended that separate ventilation is inadvisable in all cases. On the contrary, it affords great assistance in supplying air to the advanced portions of parallel headings situated beyond the last cross drivage; even for this purpose exhausters, such as the Korting, Steindel, etc., are preferable to high-speed motors, although less economical.

The practice pursued in the Ostrau-Karwin coal basin of driving parallel headings connected at intervals by cross drives for ventilation purposes is prescribed by the Austrian fire-damp regulations, which also prohibit the driving of single headings (with separate ventilation) for a greater distance than 50 m. This latter restriction might well be enlarged to 100 m. without injury, especially in coal seams with a little gas. It is also customary in case of very gassy coal to drain the gas in some measure away from the actual workings by driving separate ways through the seam, which ways are subsequently worked as part of the general system.

Leybold, in supporting the separate ventilation, laid particular stress on the greater regularity and freedom from disturbance of the main ventilating current as insured thereby, his idea being that by cutting off the more remote portions of the workings not only is a physical reduction of pressure effected in the air-currents, but that an unwelcome pressure throughout the whole pit is removed. This is, however, contrary to other experience, which leads to the conclusion that the regularity of the air-current is best secured by its conveyance in special channels, thoroughly isolated from the rest of the workings, throughout its entire length. This condition, accompanied by the provision of protective doors of suitable strength at the various points of subdivision of the main current, affords the greatest degree of security against the transmission of explosions from one section of the pit to others. This isolation of the several sections is insisted on, in the Austrian regulations already referred to, whenever the number of miners at work in a section exceeds 90, and the maximum number of men allowed to work in a section supplied by a split air-current is 100. These precaution must be regarded as the most effective means of preventing loss of life in case of explosion; at any rate, a far better method than having the whole air supply depending on the proper working of a small motor.

Navigation of the Columbia River.—Since the completion of the great locks at the Cascades in Oregon, a month ago, boats can pass from the mouth of the Columbia River to the Dalles, 230 miles. In a short time the boat railroad from the Dalles to above the Celilo Falls, 9 miles, will be finished, and boats will be able to go up the river 560 miles without change. Heretofore it has been necessary to transfer cargoes at the Cascades and at the Dalles.

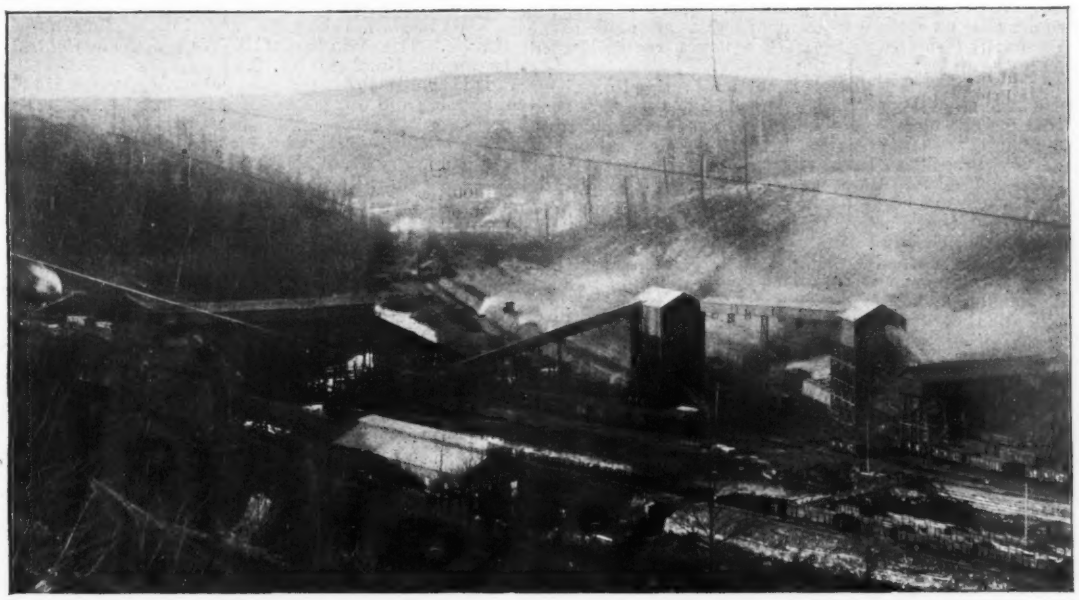
German Pig Iron Production.—The output of the German blast furnaces for the month of November was 544,667 metric tons, which compares with 554,402 tons in October. There were in all 139 furnaces in blast during the month, the number being the same as in October. For the 11 months ending November 30th the total production was 5,803,263 metrict tons, showing an increase of 529,870 tons, or over 10 per cent., as compared with the corresponding period in 1895. The production for the 11 months was made up as follows: Forge iron, 1,540,900 tons; foundry iron, 825,283 tons; Bessemer pig, 472,710 tons; Thomas pig, 2,969,370 tons. Of the total production therefore 3,442,080 tons, or 59·3 per cent., were intended for use in the manufacture of steel.

CENTRAL ELECTRIC STATION OF THE DAVIS COAL AND COKE COMPANY.

Written for the Engineering and Mining Journal by Timothy W. Sprague.

The Davis Coal and Coke Company, large miners and shippers of bituminous coal and manufacturers of coke in West Virginia, operating mines and ovens all along the West Virginia Central & Pittsburg Railroad from Piedmont to Elkins, is the first company in that entire region to adopt electricity in connection with any mining operations. At Thomas, in Tucker County, the company has two mines, one operated as a drift mine and the other by a shaft, the two seams mined covering practically the same territory. At Coketon, about two miles distant, are two other drift mines and three banks of coke ovens, comprising in all about 500 ovens. There are a few ovens at Thomas also. The coal territory which is reached by the openings at Thomas and Coketon is of very large extent, and after a careful investigation it was decided best to locate the electric power station at Thomas, and make it a central distributing station for all these operations. This site was favorable also from the fact that a battery of boilers was already installed there for operating the shaft hoists and pumps, and a good water supply was available.

Accordingly the boiler capacity was doubled and a substantial power-house built about 200 ft. from the boiler-house. The power-house itself is of brick, laid on heavy stone foundations. It is 49 ft. 2 in. × 52 ft. 8 in. in extent, and the walls are 14 ft. high. The walls are reinforced by 4 × 18-in. pilasters spaced 1 ft. 5 in. apart, and large windows 4 ft. × 7 ft. 8 in. furnish good light. The roof is a steel truss structure, covered by 3-in matched strips and a fireproof roofing material. The inside walls and roof are painted white, and with the coach black of the trusses present a very pleasing contrast, and at the same time make the interior very light. It is a fact, perhaps not generally recognized, that with a power-house interior attractive in appearance and well lighted, the incentive for the engineer to keep the apparatus correspondingly clean and bright is a strong one.



GENERAL VIEW OF COKETON OPERATIONS, DAVIS COAL AND COKE COMPANY.

The flooring is 2-in. oak laid on joists 12 × 2 in., which are in turn supported by heavy floor timbers. The foundations for engine and generator are of solid masonry extending some 8 ft. through the soil to bed rock, and are entirely separate and distinct from the building and floor foundations. The building is designed to contain at least three units of power generation each of from 150 to 200-H. P. capacity. At present but one of these units is installed. It consists of a 15 × 21-in. simple engine made by the Atlas Engine Works, of Indianapolis, Ind., of a new type called the "Cycloidal." The engine is shown in the second illustration. Its foundation is covered by a capstone of native sandstone with beveled edge on which the iron base-frame fits. The engine itself is of massive construction, weighing complete a little over 16 tons. It is operated on an initial pressure of 80 lbs. per square inch, and runs at a speed of 200 revolutions per minute. The engine gets its name from the fact that the steam valves are operated for any port opening by the least motion of a simple cycloid. The exhaust valves are operated by a fixed eccentric.

The engine is belted to the generator by an endless double leather belt, 17 in. wide. The steam pipe leading to the power-house is designed to carry steam for the entire plant after additions are made. It is covered with an insulating material and leads into a separator immediately on entering the building. From the separator a smaller pipe leads to the engine, all piping having flanged fittings.

The generator, which runs at 900 revolutions per minute and is of 100 K. W. capacity, was manufactured by the General Electric Company and is wound for a potential of 500 volts three-phase alternating current. This type of machine was chosen on account of the long distances to which power will eventually be distributed, for which static transformers may later be required, and also because the three-phase motor offered some advantages in the work to which power was to be applied. The generator and its exciter are shown in the second illustration. From the generator the main leads and also the exciter and rheostat leads pass through the floor in heavy porcelain floor insulators and thence in conduits under the floor to the switchboard. They are

carried on porcelain insulators, and are of best insulated cable, rubber covered and outside braided. The conduits are made perfectly tight, are painted with an insulating compound, and are accessible in all parts by means of trap doors in the flooring.

The switchboard consists at present of two panels, one for the generator and the other a distributing panel. They are both of blue Vermont marble, with all connections on the back of board. The generator panel carries a station transformer, lightning arresters, three main cut-outs, ammeter, voltmeter, ground detector, main switch, exciter switch, and two Carpenter enamel rheostats on the back of the board. The feeder or distributing panel carries 12 cut-outs and four circuit switches, two of 150 amperes capacity, one of 75 amperes and one of 30 amperes. The circuits from these switches are of heavy insulated cable for a distance sufficient to remove all possibility of short circuiting by contact, and thence are of bare wire. When the house was originally designed it was the intention to carry all the circuits out through the north wall, which is directly back of the switchboard, and a wire arch, which is partly shown in the illustration, was placed therein. Afterward, when a change in the applications of power and location of circuits was made, more lines running south from the power-house were needed; hence the number of circuits which are carried through the house on the roof trusses as shown, and pass out through porcelain tubes over the window, as shown in the first illustration. These wires were not permanently placed when the photograph was taken, hence their rather ragged appearance.

The power is at present used in coal cutting and the operation of five elevators and conveyors. The coal-cutting circuits run distances of a little over half a mile in two directions in the drift mine, approximately north and south of the power-house. The north circuit passes in through the air course, and keeps in the air course all the way to the face except for a short distance where it is run along the main left haulway, partly along the roof and partly in a channel along the rib. Junction boxes are placed on the line near the face, from which connections are made to the machines through heavily insulated cables. These boxes are so located that two or more rooms can be reached from one box.

For the right or south side the current is carried overland for about half a mile, entering the mine through a newly opened manway. Thence it branches and covers a considerable territory along the main and cross entries. The junction boxes are installed here as on the north. The cutters are operated by three-phase induction motors. They are of the chain pattern, made to cut a kerf 39 in. wide and 5 in. high, to a depth of from 5½ to 6½ ft. Seven machines have been installed, four of the longer type and three of the shorter. They make a full undercut in from 3½ to 4 minutes in this coal and withdraw in 12 seconds.

The company has found it most advantageous to do the undercutting on a bench, about half way up the seam, which averages from 6 to 8 ft. in thickness. The machine makes its first cuts in forming the bench, on an adjustable truck, and these trucks also take the machines readily off the bench for transportation to the next room. When cutting on the bench the upper part of the seam is shot down, and later the end of the bench is shot up. This plan has been proving very satisfactory during the time it has been in operation. The coal shoots more easily after the bench cutting than when the cutting was done on the floor, and more lump coal is obtained. It is estimated that the machine mining gives one-fifth more lump coal than pick mining.

The shooting and loading of the machine mined coal is at present contracted on a basis of a little over 50% of the price paid for pick mining. The machines when operated to their capacity yield from 125 to 150 tons run-of-mine coal per machine per shift. Three machines are intended to be run on the right and three on the left, leaving one always in reserve. The company has adopted a rigid system of inspection, and the record of repairs of each machine is carefully kept. A repair shop, which is supplied with current has been fitted up near the bank mouth where the machines can be run in on their mine trucks; in it also is the carborundum grinding wheel on the armature shaft of a 1-H. P. induction motor, which is used for sharpening bits. The cutters themselves have already been illustrated in these columns. They are equipped with 10-H. P. induction motors and their design places all gearing under the motor, where the gun-metal shield of the motor protects it thoroughly. The motors will develop 20 H. P. with safety, and the machine itself is mechanically well able to bear a greater strain. The first cutting done was in a "horse-back" bone formation which is extremely hard and ground the bits in short order, but the motor and driving gear were equal to the strain. The bits on this machine are fitted into curving sockets, so that nearly all the stock in the bit can be utilized and the grinding and shaping is a very simple matter.

The old method of operating the elevators at Thomas was by means of a wire-rope transmission from a slide-valve steam engine. The rope led from the engine pulley to the first elevator tower, and by means of a clutch the rope leading to the second tower could be thrown in. The result was a great deal of vibration in the towers and great loss by friction and slip. As at present arranged, a 5-H. P. motor is geared with double speed reduction to the smaller elevator, having a duty of raising 400 tons slack per day of 10 hours, about 50 ft. A 10-H. P. motor for the shaft elevator has a proportionally heavier duty. The motors have been in constant use since first started, and have been responsible for no delays in this part of the plant. They are of the induction type, with no commutators nor brushes, an important feature, as they are placed where it is necessarily exceedingly dusty. They require no attention beyond an occasional oiling and inspection, and are effecting a large saving over the former cost of operating these elevators. As no rheostats are required for starting these motors, the only apparatus used beside the motor is a three-pole switch and cut-out.

From the power-house a circuit is carried to Coketon, nearly two miles southwest. The poles for this circuit, also used by the right coal cutting circuit as far as the manway, are 30 ft. 8-in. poles, firmly set 6 to 8 ft. in the ground, placed at distances of about 125 ft. apart, and carry two 4-pin cross-arms. The top of the pole also carries a pin, so that the two cross-arms and this pin provide for three circuits. These lines, and, in fact, all the outside lines and apparatus are thoroughly protected from damage by lightning by Wirt lightning arresters, of which 45 altogether are in use.

At Coketon, as shown in the first illustration, the company has a very extensive coke plant. The first bin shown on the right is called No. 3 and the middle bin No. 2. Each of these bins has a capacity for holding about 800 tons of slack. The larries run under them and are charged from the charging doors, of which there are several for each bin. The bins are in size about 30 × 50 ft. and 67½ ft. high, with an inverted pyramid bottom. No. 3 takes slack from the tipple just below it, and No. 2 from the tipple on the extreme left. Connecting the two is a truss bridge, over which a conveyor runs. Both these elevators and the conveyor are operated by motors, all three being of 20 H. P. capacity each. The conveyors are of the oblong flight type, put in by Heyl & Patterson, of Pittsburg. The motor which runs the horizontal conveyor is in bin No. 2. It is controlled by a double-throw switch which is all that is necessary to obtain the reversal which is required in this conveyor. The heads and chutes are so arranged that either elevator can be made to feed into its bin or into the conveyor, the change requiring no delay, and as the conveyor can be reversed inside of a few seconds, the slack from either mine can be put in either bin at a moment's notice. This arrangement does away with the necessity for running both mines in order to get slack for both lines of ovens. One man looks after the motors and the manipulation of the chutes, etc. The saving effected by means of this method of operating cannot be estimated, as the bins are both new and their elevators were never operated by any other means, but it can readily be seen that it is considerable, aside from the convenience and the freedom from risk of frequent shut-downs. The elevators are not necessarily in constant operation, and if worked by steam several hours' notice would be required before starting, or else steam would have to be kept up at all times. Now, all that is necessary to start any or all the apparatus is the throwing in of one or more switches. During the trial of one of these elevators, when everything was rough and friction very great, a test was made as to what load the motor would carry, and it was found to stand a load of about 100% more than its rating.

The illustration shows the pole line leading north toward the power station. The main line of the West Virginia Central Railroad runs between bins No. 2 and No. 3.

It is probable that the use of electric power will be further extended in the spring and utilized for haulage, pumping, ventilating and other purposes.

The writer is indebted to Mr. F. S. Landstreet, general manager of the company, and Mr. W. R. Davis, assistant manager, for information kindly furnished regarding the operation of the plant, and also for the photographs from which the illustrations have been made.

ABSTRACTS OF OFFICIAL REPORTS.

Lehigh Valley Coal Company.

The report of this company, which is appended to that of the Lehigh Valley Railroad Company, shows that during the year ending November 30th, the quantity of coal shipped by the company was as follows:

	1894.	1895.	1896.
From collieries owned and operated.....	2,061,115	2,619,960	2,819,757
" " worked by tenants.....	2,822,135	2,864,090	2,278,434
Total.....	4,883,250	5,484,050	5,098,191

There was, in 1896, a decrease of 385,859 tons, or 7%, as compared with the preceding year. The shipments in 1896 were made up as follows: Wyoming region, 2,383,951; Lehigh, 684,960; Pottsville, 119,974; Mahanoy, 1,142,366; Shamokin, 766,940 tons.

The report gives no statement of the earnings of the company, of the prices realized for coal, nor of the cost of mining.

The condensed balance sheet of the company at the close of the year is given below:

Liabilities:		Assets:	
Capital stock.....	$650,000	Property of all kinds.....	$11,543,890
First mortgage 5% bonds.....	11,782,000	Advanced royalties.....	3,502,953
Snow Shoe bonds.....	500,000	Cash.....	363,584
Due Lehigh Valley R. R. Co....	5,166,890	Notes, accounts and balances...	3,065,776
Sundry accounts.....	1,140,980	Coal on hand.....	2,690,285
Profit and loss.....	1,928,552	Sinking fund.....	1,934
Total.....	$21,168,422	Total.....	$21,168,422

It is to be noted that the advances from the Lehigh Valley Railroad Company increased $1,862,397 during the year; that may be taken as the amount in addition to its earnings which was required to carry the company through the year. Part of this, however, may have resulted from the large increase in the stocks of coal on hand. The Lehigh Valley Railroad Company paid in 1896 the sum of $590,650 as interest on bonds of the Coal Company.

The property account is made up by the following items: Coal properties, $4 739,928; colliery improvements, $5,532,924; West Superior coal storage, $351,855; Calumet docks, $215,615; interest in allied companies, $703,568; total, as above, $11,543,890.

The report says: "The present capacity of the collieries operated by the Coal Company per day of ten hours, as shown by the results during the year, is about 17,966 tons, an increase of 2,275 tons as compared with the capacity at the close of the fiscal year of 1895, due principally to our acquisition of the collieries upon the Locust Mountain property and to Primrose, which was idle in 1895. In all, 792,867 tons were shipped from property covered by mortgage, making the gross sum set aside for the sinking fund this year $79,287.

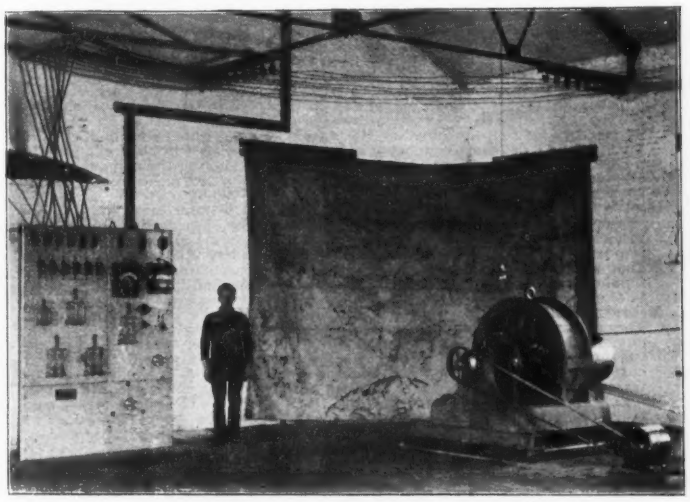
"The coal storage plant at West Superior has been completed and kept in successful operation throughout the year. Active operations upon the Calumet dock, which is located at South Chicago, were commenced on February 1st, 1896, and the machinery completed and put in operation July 13th. The plan is designed to transfer coal directly from vessels to cars or to put it into storage and later to transfer it to cars. It consists of three large wooden storage sheds and a set of reloading pockets along the dock front, all covered with corrugated iron. Both the storage sheds and pockets are provided with necessary elevators, screens, conveyors and other appliances for economical handling. The coal is unloaded from vessels by means of five towers, with automatic

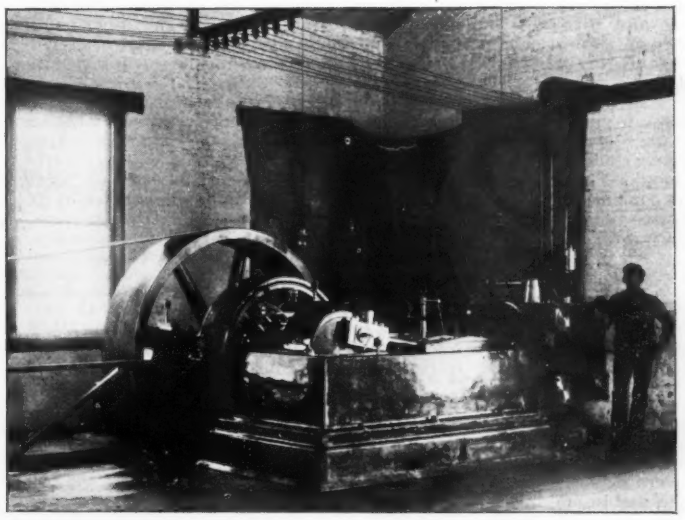
clam shell buckets. The entire cost of the plant, machinery, dock repairs, dredging slip, etc., was $205,848, exclusive of the cost of the real estate. This dock, though differently designed, works upon the same general principle as our dock at West Superior and is most satisfactory. The average cost of discharging vessels at West Superior during the boating season was 3·63c. per gross ton, and at Calumet Dock for three months the average cost was 5·49c. per gross ton, as against a cost of 17·17c. per gross ton under the old system at Chicago avenue and 19·06c. per gross ton at Harrison street, Chicago. The reason for a higher cost at Calumet Dock than at West Superior is because of the lack of experience in handling the machinery. Next season should show the cost of discharging at each to be the same."

The total capacity of the company's coal yards and stocking grounds now amounts to 1,226,000 tons.

The Lehigh Valley Railroad carried in 1896 a total of 11,534,854 tons anthracite and 819,938 tons bituminous coal, or 12,354,792 tons in all. The mileage statement shows 1,333,952,012 ton-miles of coal, the average haul having been therefore 108 miles. The average rate realized on coal was 0·646c. per ton-mile, an increase of 0.006c. over 1895. The total earnings of the railroad from coal carried were $8,623,574 for the year.

The report of the Railroad Company says: "Our Hazelton and Beaver Meadow coal lands being entirely distinct from our railroad lines, and being operated under leases either by the Lehigh Valley Coal Company or by other parties, a charter was obtained for the Hazleton Coal Company, to which these coal properties were deeded, and all the stock of which belongs to the Lehigh Valley Railroad Company. Its first mortgage 5% bonds for $2,000,000, taken in part payment, have been guaranteed by the Railroad Company."





SWITCHBOARD, GENERATOR AND ENGINE, DAVIS COAL AND COKE COMPANY'S CENTRAL STATION.

A Hydraulic Mine Pumping Plant.—The Tasmanian Gold Mining Company is about to install a hydraulic pumping plant, consisting of a triple-expansion vertical inverted engine to indicate about 700 H. P., with hydraulic pumps under each cylinder, says London *Engineering*. This, with four large boilers, will be placed on the surface at the pit head, and a hydraulic engine to work at a pressure of 2,100 lbs. per square inch will be fixed at a depth of 900 ft., the water being conveyed to it through a 4-in. pipe carried down the shaft from the pumps at the top. The hydraulic engine will actuate existing plunger pumps raising water 200 ft. to a point where it can be dealt with by the present machinery. The new plant has the advantage of keeping the shaft clear of all moving parts; it only being necessary to provide room for the pipes. The whole of the new work will be manufactured by Messrs. Easton, Anderson & Goolden, Erith, London, England.

Manufacture of Calcium Carbide in Great Britain.—Mr. F. G. Worth, Managing Director of the Acetylene Illuminating Company, of London, writes to *Engineering* as follows: "We have been engaged for 18 months in conducting exhaustive experiments, before going to Foyers, in the manufacture of carbide, and it is only recently that we have felt justified in going beyond the experimental stage. Our new works at Foyers—where, by arrangement with the British Aluminum Company, we have secured the temporary use of some of their spare power, pending the erection of very much larger plant elsewhere (several thousand horse-power)—are not yet complete. We are as yet quite unable to meet the demand, and, in fact, have to refuse several 50-ton orders, as we cannot guarantee delivery. At the present moment I believe that we could get orders for over 1,000 tons were we able to make carbide in sufficient quantity. As a matter of fact, there is a tendency to go too fast in the application of acetylene, it being apparently overlooked that, to make acetylene, carbide is a necessity, and that to make good carbide, on a commercial scale, specially constructed costly machinery and apparatus are required, with experience in their manipulation. Carbide cannot be made economically on a small scale.

"We do not expect that acetylene will supplant coal gas or the electric light in places where gas works or electric stations exist, unless the prices charged be abnormally high; but for country houses, churches, factories and villages where no gas or electrical works exist, as well as for lighting railway carriages and small railway stations, we are satisfied there is an enormous field for its use.

"We have commenced making carbide at Foyers, and we have turned out ingots weighing from over 5 cwt. to over 10 cwt."

THE SIBERIAN RAILROAD IN CHINA.

The details of the treaty agreement lately concluded between Russia and China regarding the construction of a Chinese Eastern Railway have been reported to the State Department by Consul-General Karel of St. Petersburg. At the beginning of the work on the Siberian Railway, the Trans-Baikal and Amour section was planned to extend through Sretensk, on the Shilka River, to Pookoovakaia, thence along the northern bank of the Amour to Khabarovsk, to join the Oussuri road. But investigation clearly showed that the construction of a line in that section involved such structural difficulties as would greatly increase the cost of the undertaking, and it was found that a line through Manchuria would not only be cheaper and shorter, but present other advantages, and, as a result of negotiations, the Chinese government gave a concession to the Russo-Chinese Bank, and a new company, called the Eastern Chinese Railway, was formed for the construction and exploitation of a railroad within Chinese territory from a point on the western frontier of Hoilung-Chang to a point on the eastern frontier of Kirin, and to be connected with the Russian-Siberian line. The company is granted concessions to work coal and other mines and to conduct industrial and commercial enterprises in China in connection with the railroad or separately. The company assumes its rights under the convention when it proves to the Russian Minister of Finance that the first installment of shares has been paid in. Shares can be held only by Russian and Chinese subjects. The Russian government will really control the line entirely as to management, facilities for traffic, etc. After 80 years the road will revert to the Chinese government. China agrees that baggage and merchandise shall have free transit through its territory without taxes, if destined for a Russian station, and goods imported into China over the road pay only half the usual customs duty. The stock capital of the road has been fixed at 5,000,000 paper roubles ($2,570,000) divided into 1,000 shares, but bonds will be issued as required. The officers of the company are in Peking and St. Petersburg, and meetings may be held at either place. The president of the road is appointed by China, but the nine directors are to be elected by the shareholders and the directors elect the vice-president. The company must begin work in August, 1897, and the line is to be completed in six years. The total length of the Manchurian line will be 1,273 miles, of which 945 will be in Chinese territory, and it will save 341 miles over the line to Vladivostock, as originally located. The line will be simply a section of the Siberian Railroad. It will open up a region which is known to be rich in gold and other minerals.

Ship Building in the United States.—For the six months ending December 31st there were completed in the United States 222 sailing vessels of a total registered tonnage of 34,584 tons, and 162 steam vessels of a total of 78,989 tons. The average for the sailing vessels was 156 tons and for the steamers 488 tons. The largest steamers built were in the lake district, three having been completed which registered over 4,500 tons each.

High-Pressure Marine Engines.—About the highest point yet reached in marine engine practice is found in the quadruple expansion engines that are being built by the Chicago Ship Building Company, for the new Lake steamer *Crescent City*, which are to be supplied with steam at 250 lbs. pressure by Babcock & Wilcox water-tube boilers. The cylinders will be 19, 28, 41 and 60 in. diameter with 42 in. common stroke of piston.

Manganese Ores in India.—According to the Indian mineral report manganese ores are found in large quantities and in pockets close to the surface along the East Coast Railway in the Vizianagram State. Another hopeful locality is Jubbulpore, and it is also found in the Bombay Presidency and in Lower Burma. The Madras Presidency is the only one exporting the ore at present, the quantity shipped in the fiscal year 1895-96 being 22,758 tons, of which 19,358 tons went to Great Britain and 3,400 tons to the United States.

CALCIUM CARBIDE AS A REDUCING AGENT.

By H. N. Warren.

The author says, in the *Chemical News*, that since the introduction of this remarkable substance, it is significant that scientific men have been content to allow the product to rank solely as a water decomposer, and thus regard the production of acetylene the only available product. Researches of a somewhat lengthy description, which have lately been carried out at the Liverpool Research Laboratory, involve the use of calcium carbide as a metallurgical reducing agent.

In the first instance an excess of litharge was heated to redness in contact with the carbide, in a clay crucible, the reaction being accompanied by vivid incandescence, resulting in the formation of metallic lead and calcium oxide, CaO. A further portion was now selected, in which the proportion of carbide exceeded that of the litharge; this was further subdivided into various smaller portions, each portion being exposed to various temperatures, resulting in a regulus of calcium and lead of varying percentage, together with the expulsion of CO_2.

The alloys thus formed are all more or less brittle, and to a certain extent sonorous when struck, their melting-point ranking below that of pure lead, and are slowly, but completely, decomposed in contact with aqueous vapor, the reaction being much less energetic than that afforded by alloys of lead with the alkaline metals. Stannic oxide, cupric oxide, and also ferric oxide, at corresponding higher temperatures, were readily reduced, yielding results of no practical value; in the case of the cupric alloys those samples containing under 1% of calcium, being rendered cold-short and breaking under very small strain; while, on the other hand, iron containing calcium approaches in appearance that of ferro-manganese, being even more brittle, and very oxidizable in contact with water.

In a further operation, oxides of manganese, nickel, cobalt and even chromium, molybdenum and tungsten were readily reduced, yielding calcium alloys. Results of experiments comprising the reductive action of the carbide upon the earthy chlorides and their haloids will be shortly at hand. The already partial success of these reactions seem to point most conclusively toward a new and powerful reducing agent, which at the same time, considering the market value of the carbide in question, could not fail to replace both sodium and potassium.

Russian Iron Ore in Germany.—It is reported that a metallurgical concern in Upper Silesia has contracted for the supply of a large quantity of South Russian iron ore. This is a new departure and one which is attracting some attention in German iron trade circles.

Coal Converted into Gas in Great Britain.—According to a recent parliamentary return, in 1882, the quantity of coal used for gas-making in Great Britain was 4,928,695 tons, from which 49,360,289,059 cu. ft. of gas were made. In 1895 the production of gas amounted to 121,421,752,691 cu. ft., and in making this 11,937,446 tons of coal were used.

An Indian Mountain Railroad.—One of the most interesting narrow-gauge lines in the world is that from Siliguri to Darjeeling in India. This line is but 51 miles long, and climbs more than 7,000 ft. in this distance. The gauge is 2 ft., and the engines, weighing 12 tons each, are capable of hauling a load of 39 tons, inclusive of their own weight, up an incline of 1 in 25. The cost of the line has, it appears, been about $17,500 per mile, and a dividend of 10% yearly is paid.

Locomotive and Car Building in 1896.—According to the *Railroad Gazette* there were 51,189 new freight cars built in the United States last year, which compares with 36,100 in 1895 and 18,000 in 1894. In 1890 the number reported was 103,000. The new passenger cars numbered 474, which again compares with 430 in 1895, but with 2,195 in 1892. The number of locomotives turned out was 1,175 as against 1,101 in 1895, and 2,165 in 1891, the year of largest production.

Fireproof Paper.—Herr L. Frobeen, of Berlin, Germany, has invented and is making a new fireproof paper. By his process 95 parts of asbestos fiber of the best quality are washed in a solution of permanganate of calcium and then treated with sulphuric acid, the fiber being thus bleached. After treating the fiber in this manner, five parts of ground wood pulp are added, and the entire mass placed in the agitating box, with an addition of some lime water and borax. After being thoroughly mixed the material is pumped into a regulating box and allowed to flow out of a gate into an endless wire cloth, where it enters the usual paper-making machinery. Paper produced in this way, it is reported, will resist even the direct influence of a flame and may be placed in a white heat with impunity.

PATENTS RELATING TO MINING AND METALLURGY.

United States.

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

WEEK ENDING JANUARY 5TH, 1897.

574,391. PROCESS OF MAKING BICHROMATES. Guilliam H. Clamer, Philadelphia, Pa. Assignor to the Ajax Metal Company, same place. The process consists in fusing together powdered chrome ore and an alkali nitrate, and allowing it to cool, afterward powdering same and mixing with a caustic alkali and a sufficient quantity of alkali nitrate to complete the oxidation of the ore.

574,402. MINING MACHINE. Henry B. Dierdorff, Columbus, O. Assignor to Joseph A Jeffrey, same place. The combination with a stationary bed-frame and the sliding frame of the power-shaft, the intermediate shaft and the reversible double-speeded carriage-moving shaft, the carriage-advancing mechanism having the shaft driven by the intermediate shaft, and the carriage-withdrawing mechanism consisting of a shaft parallel with the carriage-moving shaft and geared to it.

574,439 APPARATUS FOR REDUCING, SEPARATING AND REFINING METALS. Jonathan A. Mays, London, England. Patented in England February 7th, 1893, No. 2,639. The combination of a revoluble receiving vessel, means for rotating the same, eduction-tubes at different levels, collectors for receiving the separated substances and a heating chamber inside the receiving vessel.

574,589. STEAM ORE STAMP. Charles W. Tremain, Portland, Ore. The combination with the cylinders and the pistons, and a single valve controlling the ports admitting steam into the cylinders, of one independent set of ports and ducts for conducting into the valve-chamber to move the valve, a portion of the live steam admitted into the cylinder below the piston to lift the stamp, and another independent set of ports and ducts for conducting another portion of the live steam from the under to the upper side of the piston in the cylinder to cushion the piston head.

574,637 and 574,668. METHOD OF MAKING CARBONIZED STEEL FOR ARMOR PLATES. Frank L. Slocum, Pittsburg, and William E. Corey, Munhall, Pa. Assignor to the Carnegie Steel Company, Limited, Pittsburg, Pa. The process consists in subjecting the steel in a heated condition to contact with acetylene gas.

574,664. PUMP. Francis L. Clark, Stewart Station, Pa. Filed February 17th, 1896. The combination of a frame adapted to be supported adjacent to a power-imparting shaft, a pump-casing connected to the frame, a pump-shaft journaled in the casing, pump-cylinders connected to the casing, a frictional driving-roller and an eccentric, each fixed on the pump-shaft, pistons fitting the pump-cylinders and coupled to straps on the eccentric, and friction-rollers journaled in the frame with their axial planes parallel to that of the pump-shaft.

574,705. OIL-WELL TOOL. Max Blumenthal and Herbert Kintz, Sharpsburg, Pa. The combination with a stem and a member connected thereto, the stem having an exterior shoulder near the joint with the member, of a casing inclosing the joint and secured at one end to the member and provided with an interior shoulder near its free end to engage the shoulder on the stem in the event of a break at the joint.

574,751. CRUSHING APPARATUS. Ignacio Montes de Oca y Melian, New York, N.Y. The combination with a frame, of a shaft mounted in the frame, a cam carried by the shaft, two vertically-movable stamps, a mortar for each stamp, two levers fulcrumed on the frame and respectively connected with the stamps, the levers being engaged and operated by the cam, and a cord connected with each lever and capable of holding the same out of engagement with the cam whereby the operation of either stamp may be suspended.

574,781. MANUFACTURE OF SHEET METAL. John F. Budke, Canonsburg, Pa. Assignor to the Canonsburg Iron and Steel Company. The method consists in pickling the sheet bars for the purpose of removing cinders or other impurities from the surface thereof, washing the bars, heating them to a good rolling temperature, reducing them by rolling to approximately the finished gauge, pickling and washing the sheets, and finally reducing them to the finished gauge.

574,790. MINING MACHINE. Hugh F. Doris and John J. McCloskey, Pittsburg, Pa. The combination of a stationary frame, a movable frame carried thereby, cutters at the outer end of the movable frame, a carrier-chain encircling the movable frame and coacting with the cutters, a driving gear for the cutters, a similar gear for the chain, and a motor carried by the movable frame and common to and driving both the cutter and chain gearing.

574,821. MINER'S LAMP. Moses Raker, Olyphant, Pa. A blank for forming a miner's lamp from a single piece of metal, consisting of the body portion or wings, the wick-tube, and the braces; the body portion being separated from the braces at its top edge, at an acute angle, and the braces being made to extend from opposite edges of the wick-tube and made widest at their lower ends.

574,822. COAL-MINING MACHINE. Edward P. Rauscher, Chicago, Ill. Assignor to the Morgan Gardner Electric Company, same place. The combination with the driven shaft and worm, longitudinally movable thereon, of the hollow washer, resting upon the worm and having a conical hole in its upper end, and a collar having a corresponding conical end resting in the conical hole in the washer, whereby the collar will split the washer before sufficient strain is put upon the other portions of the machine to injure the same.

574,841. MACHINE FOR CRUSHING ORE, ETC. Otis Williams, St. Johnsville, N. Y. The combination of a suitable frame and a support therefor pivoted at or near its end, means for holding the support or pivoted part of the frame in an elevated position, a longitudinal coupling-rod having a hooked end to engage with a link or other device on the lower end of the movable jaw, the rod extending through the support or pivoted portion of the frame, and means for drawing the rod tight to hold the toggles in position with relation to the lever, movable jaw, and block.

Great Britain.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

WEEK ENDING NOVEMBER 14TH, 1896.

19,784 of 1895. J. Jones, Bilston. Apparatus for diffusing the blast from the tuyeres on blast furnaces.

22,137 of 1895. W. Woolf, London, and J. Andrews, Birmingham. Alloy containing 42 lbs. copper, 20 lbs. mixed nickel, 18 lbs. spelter, 4 oz. regulus and 8 oz. copper flux.

22,982 of 1895. W. H. Coward, London. Improvements on the Niagara Pulverizer.

23,051 of 1895. O. Hermann, Oppeln, Germany. Making porous coke by adding sawdust to the coal.

24,491 of 1895. J. Aspinall, Barnsley. Brush for miners' safety lamp.

1,144 of 1896. W. Hereus, Hanau, Germany. A form of platinum electrode.

15,129 of 1896. O. Arlt, Goerlitz, Germany. Electrodes of liquid matter which flows through electrolyte, divided into jets, continually supplied so that circuit is always closed.

20,860 of 1896. S. Morse, London. Automatic apparatus for recording the passage of ore trucks.

WEEK ENDING NOVEMBER 21ST, 1896.

20,542 of 1895. G. and W. Bell, Liverpool. Mechanical improvements in electrical apparatus.

22,816 of 1895. W. H. Coward, London. Improvements on the Niagara Pulverizer.

23,127 of 1895. W. Ackroyd and W. Best, Morley. Improvements in miners' safety lamps.

24,158 of 1895. R. H. Dundee and F. G. Jones, Grampound. Rotary rock crushers.

21,224 of 1896. E. Patterson, Oakland, California, U. S. A. Coal mining machines.

WEEK ENDING NOVEMBER 28TH.

14,783 of 1895. E. A. Ashcroft, Melbourne, Victoria. Improvements in patentee's zinc lead sulphide process.

23,097 of 1895. R. Heathfield and W. S. Rawson, London. Improvements in the electrolytic deposition of zinc.

23,665 of 1895. L. Mond, London. Process for refining nickel by its compound with carbonic oxide.

23,969 of 1895. C. D. Ismay, Newcastle-on-Tyne. Manufacture of white lead.

123 of 1896. J. Gjers, Middlesbrough. Furnaces for the manufacture of cast steel and homogeneous iron.

19,883 of 1896. E. Fischer, Breslau, and C. G. Penney, London. Apparatus for the amalgamation of gold ores by currents of mercury vapor and air or steam.

PERSONAL.

MR. J. HARDY, manager of the West Wellington coal mines, Wellington, B. C., has resigned his position.

MR. ARTHUR L. PEARSE, of London, England, a promoter of mining sales, was in Denver, Colo., recently.

MR. GEORGE BRUCE, of Petrolea, Ont., has gone to Sumatra to develop the petroleum deposits in that island.

MR. S. E. WEIR has accepted the position of general superintendent of all the coal mines and coke ovens of the Davis Coal & Coke Co., with headquarters at Thomas, W. Va.

MR. J. W. NEILL, manager of the Taylor & Brunton sampler at Salt Lake City, Utah, has gone to Montana, where he will conduct the examination of mining property to which his attention has been called.

MR. F. W. HOYT, City Recorder, has been appointed superintendent of the Park City, Utah, sampler to succeed MR. C. D. ROOKLIDGE, resigned. Mr. Hoyt assumed the duties of his position on January 12th.

DR. WILLIAM B. PHILLIPS, chief chemist of the Tennessee Coal, Iron and Railway Company, and a frequent contributor to the columns of the *Engineering and Mining Journal*, has been in New York City on a business visit.

MR. WALTER KENNEDY, a mechanical engineer of Pittsburg, Pa., is now on his way to Japan. It is said that his trip has reference to large contracts for steel rails which the Japanese government is expected to place in the near future.

MR. L. A. WRIGHT, engineer and superintendent of the La Luz Mining Company, Cuatro Cenegas, Coahuila, Mex., has resigned to accept the position of consulting mining engineer for the Compañia Minera Fundidora, y afinadora de Monterey.

LIEUTENANT-COMMANDER J. A. ROGERS, of the United States Navy, who is at present a government steel inspector at the Bethlehem (Pa.) Iron Company's Works, has been ordered to the battleship *Indiana* as executive officer of that vessel after February 1st.

MR. J. R. RYAN has assumed the management of the Corona Coal Company, at Birmingham, Ala. He is one of the pioneer coal men in the Birmingham District, having opened the Mary Lee mines, developed the Virginia and Alabama mines and organized the American Coal Company.

MR. P. R. FORBES, who for some time past has been assistant superintendent at the Brodie Reduction Works at Cripple Creek, Colo., has been appointed superintendent in place of MR. A. C. Hunt, who was very successful in the management, but resigned on account of the high altitude affecting his health. It is understood that Mr. Hunt, who has had very large experience in cyanide reduction works in the West and in Europe, will represent the Gold and Silver Extraction Company of America in California.

OBITUARY.

J. P. STONE, of Grass Valley, Cal., died January 2d. Mr. Stone reached California in 1849 and located in Grass Valley in 1850. He filled many municipal offices and was practical and progressive. Mr. Stone was a prosperous mining man and an owner of valuable water rights. He was born in Worthington, Mass., and was aged about 70 years.

JAMES G. HAYMAKER, well known throughout the oil and gas regions, died suddenly on January 14th at his home in Pittsburg, Pa., aged 63 years. Mr. Haymaker was interested in a great many oil ventures. Five years ago he suffered severe financial loss in the panic. He has operated many wells in the McDonald region, and still held many leases.

JAMES CUNNINGHAM, of San Francisco, Cal., died January 14th in New York, where he was on a business trip when taken ill. Mr. Cunningham was born in New York in 1855. After graduating from the Yale Sheffield Scientific School at the age of 21, he went to Freiberg, Germany, where he studied mining engineering for two years, and followed that profession on his return to the United States.

MAXWELL K. MOORHEAD, president of the Monongahela Navigation Company, died at his home January 13th in Pittsburg, Pa., aged 65 years. He had lived in Pittsburg for over 60 years, and for 40 years had been engaged in the iron business. As head of the well-known firm of Moorhead & McCleane Company, and later as president of the Monongahela Navigation Company, he stood in the front rank among business men in that community.

ALEXIS JANIN died at his residence, No. 915 Hyde street, San Francisco, January 13th of heart disease. He was the youngest of three brothers, all well-known and prominent metallurgists. He was born in New Orleans, and at an early age left home to study in France, where he graduated at the University of Paris, receiving the degree of A. B. He subsequently graduated at the famous Royal Academy of Mining at Freiberg, Germany, and passed with so much credit as to entitle him to a professorship in the Academy had he chosen to remain. After devoting 12 years to study in Europe, Mr. Janin returned to this country, and began his professional career in 1868, when he immediately became identified with the Comstock mines, in the development of a process for working the mill tailings. He then took charge of the Meadow Valley mill, situated at Bullionville, Nev., making frequent trips to mining camps in the United States, Mexico, Central and South America, for the purchase of mines. Having devoted more than twenty years of study to the amalgamation of ore, he probably knew more about the amalgamation process than any other engineer. He was an accepted authority on all matters pertaining to ores and their treatment. Previous to his death he had determined to write a book on amalgamation, but it is doubtful if his notes will now ever see the light. He had held some very prominent positions, and was employed at one time by the Japanese government, on the Island of Yedo, where he acquired an excellent knowledge of the Japanese language. Mr. Janin was an accomplished man, speaking the German, French, Italian and Spanish languages with great fluency. His body will be cremated, and the ashes will rest in the family vault at New Orleans.

SOCIETIES AND TECHNICAL SCHOOLS.

AMERICAN CHEMICAL SOCIETY.—The New York Section of this society held its regular monthly meeting at the Knickerbocker Athletic Club, on January 8th, when the following papers were read: "Note on an Improved Specific Gravity Bottle for Liquids," illustrated, by Dr. E. R. Squibb; "Note on the Determination of Caffeine," by G. L. Spencer; "Variations in the Composition of Commercial Red Lead," by Durand Woodman; "The Methods for Determination of Tannin," by J. H. Yocum, and "Modern Metallurgy of Copper," by J. B. F. Herreshoff. The address by Mr. Herreshoff treated of the historical development of the copper industry in the United States, and the increased consumption of this metal was shown to be due mainly to the application of electricity in the processes by which it is produced. Some interesting figures of copper production were given, and comparisons made with the pig-iron output, illustrating that the former metal amounted to over one-half of the value of the latter as produced annually.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—The eleventh annual general meeting of this society began on Tuesday, January 12th, 1897, Mr. Herbert Wallis president, in the chair. After the reading of the minutes scrutineers were appointed for the several ballots, and the meeting adjourned to visit the works of the Lachine Rapids Hydraulic and Land Company. About 60 members drove out to the works. After lunch there the works were visited, and the party returned to town in the early afternoon. In the evening a members' dinner took place in the Windsor Hotel, which was presided over by the retiring president. A notable feature of the attendance was the presence of five of the six living past-presidents of the society, namely, Messrs. T. C. Keefer, John Kennedy, E. P. Hannaford, P. Alex. Peterson and Thomas Monro.

On Wednesday morning the adjourned meeting for the transaction of business took place, at which the report of the council for the past year was presented. After the reading of the report an important discussion took place on the incorporation of the society, and the matter was finally referred to the council with authority to take such action in the matter as might by it be deemed best in the interest of the society.

The committee appointed at the last annual meeting on Standard Measures presented its report. The report pointed out that measurements made in the ordinary course of engineering work with measures not having the stamp of the Department of Weights and Measures were illegal; that no sufficient means existed at present for the standardizing of engineering measures, and recommended that such standards as might be found satisfactory for the standardizing of tapes and chains should be recognized by the Department as local standards for the purpose of issuing authorized standards of length; that engineers should be required to possess only one standard of not less than 50 ft. length, from which from time to time to compare their working measures. Standards or comparators of the character required have already been established at McGill University, Montreal; the School of Practical Science, Toronto, in addition to one established for the purposes of the Dominion Land Surveyors at Ottawa.

The Gzowski Medal Committee, of which Prof. Henry T. Bovey, was chairman, awarded the medal for the best paper of the year to Mr. E. Monun, of Victoria, B. C., for his paper on "The Sewerage of Victoria, B. C."

The scrutineers on the election of the Nominating Committee reported the following elected as the Nominating Committee for the year 1897: Representatives for the Province of Quebec, G. H. Duggan, H. Irwin; representatives for the Province of Ontario, A. McDougall, J. Galbraith, C. H. Rust; representative for the Maritime Provinces, P. S. Archibald; representative for the Northwest Provinces, D. A. Stewart; representative for the provinces outside of Canada, J. M. Shanly. In addition to the above elective members, the four last surviving past-presidents are also members of the committee, viz., Messrs. E. P. Hannaford, P. Alex. Peterson, Thos. Monro and Herbert Wallis.

The following are the officers and members of Council elected for the current year: President, Thomas C. Keefer, C. M. G., Ottawa; vice-presidents, Henry T. Bovey, Montreal; William T. Jennings, Toronto; William George Thompson, St. Catharines; treasurer, Kennet W. Blackwell, Montreal; secretary, Clement H. McLeod, Montreal; past-presidents and honorary councillors, Col. Sir Casimir Gzowski, Toronto; John Kennedy, Montreal; E. P. Hannaford, Montreal; P. Alex. Peterson, Montreal; Thomas Monro, Coteau Landing, P. Q.; Herbert Wallis, Montreal; members, St. Geo. Boswell, Quebec; M. J. Butler, Napanee, Ont.; G. C. Cunningham, Montreal; C. E. W. Dodwell, Halifax, N. S.; G. H. Duggan, Montreal; H. Irwin, Montreal; E. H. Keating, Toronto; G. A. Keefer, Victoria, B. C.; D. H. Keeley, Ottawa; D. MacPherson, Montreal; E. Marceau, Montreal; M. Murphy, Halifax, N. S.; H. Peters, St. John, N. B.; A. McDougall, Toronto; H. N. Ruttan, Winnipeg, Man.; librarian, William McNab, Montreal.

The newly elected president, Mr. T. G. Keefer, upon taking the chair thanked the society for the honor conferred upon him. The retiring president, Mr. Herbert Wallis, delivered a very interesting address on the consumption of coal in locomotive practice. The usual votes of thanks to retiring officers, to the railways and others were passed. The meeting adjourned at 1:30 p. m.

INDUSTRIAL NOTES.

The McNeal Pipe & Foundry Company's Works, Burlington, N. J., have been shut down indefinitely.

The Robesonia furnace, near Reading, Pa., which has been out of blast nine months, has been started up, giving employment to 200 hands.

The Whitely Malleable Casting Company's works at Muncie, Ind., have resumed operations with 800 hands. The plant has been idle for several months.

The Canadian Bridge and Iron Company, of Montreal, has gone into liquidation. The liabilities amount to about $100,000, and the assets are placed nominally at the same figure.

The United Gas and Coke Company's by-product plant, at Glassport, Pa., will be started about February 1st, when 30 of the 120 ovens will be blown in. When the ovens are in operation there will be 400 men at work.

The St. Joseph Nail Mills, at St. Joseph, Mo., after an idleness of seven years, will be put in operation about February 1st. Charles Weil, of Kansas City, will operate the works, and a large force of men will be employed.

An order for 350 automatic dump cars has been placed with a Western iron works by an export firm for prompt shipment. These cars are for the mining districts in South Africa. It is expected that in five weeks the cars will be ready to go forward.

In our Industrial column last week a typographical error made us say that the Jeffrey Manufacturing Company had its main office in Denver, Colo. It should have been the Western office, the main office of the company, of course, remaining at Columbus, O.

The North Branch Steel Company's works at Danville, Pa., have resumed operations. The plant has been closed down for several months. The company has received one large order, which alone will keep the plant running full time for two months, and other contracts indicate a season of prosperity.

The Robert Aitchinson Perforated Metal Company, of Chicago, has received a large order from the Chateaugay Ore and Iron Company, of Plattsburgh, N. Y., for ore screens. They have recently shipped large quantities of their improved perforated metal to the Tom Boy and other mines in the West.

The Illinois Steel Company has retired from the manufacture of black and galvanized sheet, and has given up the lease of the Corning sheet mill at Hammond, Ind. The entire stock on hand of black and galvanized sheets, amounting to about 1,000 tons, has been sold to J. T. Ryerson & Son, of Chicago.

The Dunbar Furnace Company, of Dunbar, Pa., has about completed repairs to its No. 2 furnace, which will be blown in this week. The furnace stack has been practically rebuilt and other improvements made which are expected to increase the output to 250 to 300 tons per day. The furnace is now 17×75 ft.

The Mineral Products Company of New York City has been incorporated to mine manganese, iron, coal and other mineral products with a capital of $100,000. The directors are: Frederick C. Sayles, of Pawtucket, R. I.; Frederick C. Sayles, Jr., of Providence; Edward F. Ward, George H. Frick and William Carl, of New York City.

The Lackawanna Iron and Steel Company's north Works at Scranton, Pa., resumed operations January 14th, after several months' idleness. With the resumption of the south mills, a week or two ago, the entire establishment is now in operation, employ-

ing 3,000 workmen. Orders have been placed to keep the entire plant at work for six weeks.

The Kootenay Iron Works is said to be looking for a location in Nelson, B. C., on the shore of the lake in the neighborhood of the Columbia & Kootenay road, and as soon as one is found the construction of a large iron foundry will be commenced. The members of the company are A. R. Barrow, George W. Richardson and George A. Bigelow.

The Williams Manufacturing Company, Kalamazoo, Mich., builds tanks of red cedar, white pine, Louisiana cypress and California red wood; also Manvel windmills, with ball-bearing turn-table. The tanks of this company are widely known and widely used, reference having but recently been made in our columns of an order filled by them for a plant in Mexico. The windmills are of two types, and have channeled steel rims requiring no nails, bolts, pins or rivets to fasten the sails. They are built in sizes from 10 ft. to 20 ft. in diameter.

The Firth-Sterling Steel Company is the title under which the consolidation of the American crucible steel business of Thomas Firth & Sons, Limited, of Sheffield, England, with the Sterling Steel Company, of Pittsburg, Pa., has been effected. The capital stock has been increased from $500,000 to $800,000, and the company's works at Lemalor will be enlarged to meet any requirements or demand. The steel department will be under the direct management of Lewis J. Firth, managing director of the Sheffield Company. C. Y. Wheeler, founder and president of the Sterling Steel Company, will have sole control of the projectile department. By this consolidation, for the first time in the history of America, Sheffield steel will be manufactured here under the same process that has made the product world-famous. Negotiations are also in progress for similar working arrangements or consolidation of interests with manufacturing firms in Germany, Belgium, Prussia, Japan and Italy.

The West Superior Iron and Steel Company is to be reorganized. An agreement for such an action was submitted on January 21st by the first-mortgage bondholders' committee to a meeting of the holders of Knickerbocker Trust Company's certificates issued for these bonds. The plan proposed that present bondholders of the steel company shall surrender their bonds and pay an assessment of 5%, receiving first-mortgage bonds of the successor company for the face of the assessment and new preferred stock for the principal of the old bonds. The new stock is to have a cumulative preference to the extent of 6% per annum. The Pittsburg Iron and Steel Engineering Company is asked to surrender its mechanics' lien claim and to pay an assessment of 5% on the debt represented, receiving new first-mortgage bonds for the face of the assessment and preferred stock of the new company at the rate of $75 for each $100 of debt represented; and common stock at the rate of $25 for each $100 of debt. All other creditors shall surrender their claims and pay an assessment of 5% on them, receiving in return new first-mortgage bonds and new preferred stock at the rate of 50% and new common stock at the rate of 50% of their claims. Stockholders of the old steel company are to pay an assessment of 15%, receiving new first-mortgage bonds for the face of the assessment and new common stock at 25%.

TRADE CATALOGUES.

The Joseph Dixon Crucible Company, Jersey City, N. J., numbers among its advertising literature two recently published pamphlets, the first being devoted to the subject of Dixon's Silica Graphite Paint, showing its merits, its purpose, its qualities and its results, and the second being a collection of testimonials from the numerous users of the paint who tell the success with which their adoption of it for various purposes has been followed.

The Card Electric Company, Mansfield, O., begins the new year with a neat catalogue of testimonials from many users of their multipolar generators and motors for lighting and power purposes. The excellence of the apparatus and the success achieved by this company is so well known that it seems almost unnecessary to publish commendations, but to those who are not acquainted with their machinery and intend to purchase electrical apparatus and wish to communicate with parties using the machines, the testimonial letters will be of interest.

The Goodsell Packing Company, of Chicago, Ill., is out with an 1897 catalogue of its well-known goods. Goodsell's rubber-back flax piston-rod packing consists of a wearing body of dry, braided flax, having a rubber back securely attached by vulcanization, which overcomes all rigid bearings, reduces friction, and greatly increases the durability of the fiber in contact with the rod. The "Dollar" packing consists of a combination of braided flax and Sea Island cotton duck in alternate plies upon the piston-rod, the whole being supported by a rubber cushion that will not harden in heat, placed behind the wearing surface. In "Sleeve" packing, the solid part is made from Sea Island cotton duck, held together with a friction of pure rubber. Alternating plies are of braided Italian flax, without grease or lubrication, and the whole surrounded by a continuous rubber cushion. Swain metallic packing consists of a series of metal rings, made from three tongue-jointed segments, backed up with an elastic cushion of fine duck.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the *Engineering and Mining Journal* of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufactures in each line.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the *Engineering and Mining Journal* are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GENERAL MINING NEWS.

OIL PRODUCTION AND NEW WELLS.—The Oil City *Derrick*, in its monthly statement for December, 1896, gives the number of new wells completed in the New York, Pennsylvania and West Virginia oil fields at 625, having a daily production of 11,698 bbls.; with wells drilling at the end of the month, amounting to 902. In the Buckeye field 299 new wells were completed during the month, having a production of 6,171 bbls. daily, while 340 new wells were under the drill on January 1, 1897. The southeastern Ohio field showed 57 new wells completed in December, 1896, with a daily production of 498 bbls., and 58 wells drilling at the end of the month. For the same period the Indiana field showed 66 wells completed, having an output of 1,100 bbls. daily, and at the end of the month 76 wells drilling.

ALABAMA.

DE KALB COUNTY.

SAND MOUNTAIN COAL AND COKE COMPANY.—This company, of which W. E. Knox, of Anniston, is superintendent, and R. L. Howden, secretary and treasurer, has been awarded a contract by the Government for all the coal used in making improvements in the Tennessee River from Chattanooga to the Mississippi.

ARIZONA.

GILA COUNTY.

BLACK WARRIOR COPPER MINING COMPANY.—The shaft on the Black Copper, near, Globe is down 175 ft., and a third shift has been added and sinking goes on at the rate of 6½ ft. or more a day, and three sets of timber are put in every other day. The shaft, an incline, is being sunk parallel to the ledge on the foot wall. The showing of ore in this mine is said to be very large. The shaft on the Dadeville is down 71 ft., and they are now crosscutting to ascertain the width of the vein, which is about 20 ft., the ore being of good average quality. The tunnel in the Jewell has been driven 230 ft. The ledge is large and will supply ore of good quality.

LOST GULCH MINING COMPANY.—This company, of Globe, recently made its first shipment of gold bullion, amounting to $900, the product of six days' run. Superintendent John Kasser states that the mine is looking very well and supplying all the ore required to keep the mill running.

MARICOPA COUNTY.

VULTURE.—This mine, near Phœnix, was sold January 12th for $15,000 under the operation of a trust deed given by ex-Senator Tabor, of Colorado, to secure a loan of $24,000. The purchaser for the creditors was B. R. Hieronymus, cashier of the First National Bank of Madison, Wis.

YUMA COUNTY.

LA FORTUNA.—This mine, 30 miles east of Yuma, is owned by C. D. Lane. The mill has 20 stamps. The vein was 12 ft. wide on the surface, but widened out to 18 ft. The ore is taken to the mill without assorting and pays $40 per ton. The mill started on September 1st, producing $14,000, October $82,000; November $94,300. This property employes 60 men, whose wages do not exceed $3 per day per man.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

EUREKA.—This mine at Sutter Creek is reported to have been sold to, or bonded by the owners of the Oneida Mine. The mine has been idle for many years. The shaft was down 2,200 ft. when the works were destroyed by fire which caused the owner to abandon operations. It is claimed that there are large bodies of low-grade ore in the mine which could be worked at a profit with modern machinery.

KENNEDY.—At this mine, in the town of Jackson, a rich strike has been reported. A short time ago a body of ore 8 ft. wide was cut on the 1,900-ft. level and after up-raising 40 ft. it pinched out. A drift was then started for it on the 21-ft. level and it was cut again and showed 20 ft. in width. A fine chute of ore has also been struck on the 900-ft. level in a drift run north 1,300 ft. from the north shaft. One hundred and ten men are employed.

BUTTE COUNTY.

(From Our Special Correspondent.)

CHEROKEE.—At this hydraulic mine at Cherokee several companies, employing about 100 men, are operating with good profit. These companies all work on a royalty which is paid to the receiver of the Spring Valley Gold Mining Company.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

OLD PETTICOAT.—This old mine, at Railroad Flat, 16 miles east of Mokelumne Hill, which was reopened by the Anglo-Pacific syndicate under the superintendency of Wm. H. Clary, has now been pumped out and the three-compartment shaft repaired, preparatory to working the mine in all the old levels. Sixteen men are employed. This mine will be developed on modern principles.

PINE LOG.—This mine, two and three-quarter miles northwest of Copperopolis, is one of a group called Royal Consolidated Mines, comprising the Ant Hill, Goodenough, Pine Log and Royal Mines. The two-compartment shaft is down 600 ft. The 20-stamp mill, located half a mile from the mine, is kept running steadily. Twenty-five men are employed.

EL DORADO COUNTY.

(From Our Special Correspondent.)

GARFIELD & EXCELSIOR CONSOLIDATED.—This property, one mile northeast of Greenwood, has been purchased by Mrs. J. W. Harrison, who intends to develop it. The lower tunnel, which extends some 400 ft. and was abandoned years ago, is to be reopened. The ledge is said to be 20 ft. wide.

PLACER COUNTY.

(From Our Special Correspondent.)

MORNING STAR.—This drift mine, at Iowa Hill, has been working steadily as usual. Sixty men are employed. Dividend No. 67 has just been declared of $6 per share.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

GOLDEN CROSS.—The output of this mine, at Hedges, is about 1,000 tons per day. The deepest workings are about 600 ft.

RANCHETA.—At this mine, 1½ miles southeast of Banner, the new 5-stamp mill is in operation on good ore. Heretofore the ore has been sent to the custom mill at Banner.

SHASTA COUNTY.

(From Our Special Correspondent.)

TEXAS CONSOLIDATED.—This property, at Dry Diggings, comprising 519 acres, is developed to a depth of 900 ft. through tunnels. The longest tunnel is 1,600 ft. long, and 650 ft. vertical depth. A winze sunk 32 ft. below the bottom of the tunnel shows the ledge to be 9 ft. wide of good-grade ore. Another tunnel is being run 225 ft. below, which is in 700 ft. The 20-stamp mill is crushing 40 tons per day. Arrangements are being made to erect an electrical plant. Eighty men are employed.

TUOLUMNE COUNTY.

RAWHIDE.—The Hercules Gas Engine Works, of San Francisco, is building a pumping plant for this celebrated mine. The engine will be of 80 H. P., horizontal single-cylinder type and will be geared directly to heavy V-tooth geared reducing motion, driving pump at 10 strokes per minute, at which speed it will be capable of raising 450 gals. per minute. The engine is an entirely new type and built specially for mining purposes. A perfect starting device will do away with all laborious turning of flywheels to start engine, and the sparking device will be so arranged that all springs controlling electrodes will be external, thereby preventing destruction of springs by heat. A friction clutch on the driving pinion will permit of the engine being started independent of the pump. After the engine is up to its normal speed a hand wheel will gradually throw the clutch and start the pump in motion. Electric power has heretofore been used for this purpose in the Rawhide.

(From Our Special Correspondent.)

ARBONA.—This mine, south of Tuttletown, has run a 200-ft. tunnel which taps a vein from 2 ft. to 5 ft. in width, which assays from $5 to $50 per ton. Drifts have been run north and south. This mine looks promising.

YUBA COUNTY.

(From Our Special Correspondent.)

NEW BLUE POINT.—A two-third interest in this placer mine, including 30 miles of ditches and about 2,300 ft. of tunnel, is reported to have been sold for $100,000 to a Chicago syndicate, which, it is said, will erect a water-power plant and work the property on an extensive scale.

COLORADO.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

BEAM PROCESS.—In this new mill, at Empire, on a test lot of 6½ tons, worth $6 per ton, the loss was 60c. a ton. The cost of working this was not given, but, from a personal investigation, the cost of treatment would almost exceed the gross values of this ore.

CHAMBERLAIN & COMPANY.—Referring to the past year the Georgetown *Courier* says that the average contents of the ore shipped by this company were 125·61 oz. silver, 0·13 oz. gold per ton, and 13% lead. The western end of Clear Creek County is one of the very few mining districts in Colorado that is working out its own salvation. For several years capital has fought shy of the district because its product is mainly silver. Yet for all that with

the low price of silver and lead, the product has averaged about $1,600 for each man engaged in mining.

CROWN POINT-VIRGINIA MINING COMPANY.—The property owned by this company, at Idaho Springs, is now operated by the court because of a disagreement among the stockholders. Only enough ore is coming out to pay the running expenses.

FRANKLIN.—A new shaft has been completed to a depth of 210 ft. on this mine, at Idaho Springs, and after putting in stations it will be continued to 450 ft. to connect with the tunnel. Large bodies of ore are showing in all of the workings.

HOT POT.—The new machinery on this mine, at Idaho Springs, has been installed, and sinking of the shaft on a body of low-grade ore is under way.

LORD BYRON.—At a depth of 200 ft. in the shaft of this mine, at Idaho Springs, 2 ft. of $45 ore has been opened. The mineral is a lead and copper and is in demand at the Denver smelters for fluxing purposes.

NIAGARA.—An Eastern pool is being formed for working this mine, at Idaho Springs, and consolidating it with a number of adjoining claims, thus making a group similar to the Stanley,all of whose lodes lead into the new group being formed.

SMELTER CHARGES.—It is reported that a combination has been made for a $2 advance in treatment charges at the various smelters. However, it is given out that Clear Creek ores will not be affected, as they are in demand for fluxing purposes.

SPEAR.—An important strike has been made in this location, lying just below the Champion mine, on a lode which seems destined to make another big mine in that vicinity. Three inches of the mineral run very high in gold and the balance, 2 ft. wide, is high grade concentrating ore.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

ACCIDENT.—This claim, on the west slope of Gold Hill, is being worked under lease by a Mr. Harrington, who has sunk a shaft 100 ft. deep and extended levels both north and south at 50 ft. and 100 ft. From the first level the lessee is taking out oxidized gold ores of about $20 per ton, while at the 100 ft. level he is taking from the vein silver ores assaying 180 oz. galena, zincblende, gray copper ore, and calcite crystals. The formation is granite.

ANACONDA.—These properties on Gold Hill are being vigorously worked, not only by the company, but the lessees are working with a will rarely seen in lessees. At the last annual meeting the lesses paid to the company as royalties $3,335.30, while this year that amount will be increased, by present showing, fully 300 per cent. The smelting ore last year averaged, after deducting freight treatment charges, $62.50, and the milling ore, 3,643 tons, was of an average net value of $13.66. This year the mill ore will be doubled, and the shipping ore of a very much higher grade. The company has just received four new self-dumping cars, in order to move the waste dump, which the Florence & Cripple Creek Railway will use as ballast on its track. Dumping room is at a premium, as the mouth of the tunnel is in the town of Anaconda.

ANCHORIA-LELAND MINING COMPANY.—This company, on Gold Hill, has commenced to sink the Dickerman shaft below the 700-ft. level, and the water has fallen off considerably during the last two weeks. The mine steadily increases its output.

AREQUA TOWNSITE.—J. L. Lindsay, cashier of the First National Bank of Cripple Creek, is working block 22 under lease and bond, and at a depth of 12 ft. has opened up a vein which shows quite a little free gold, samples assaying $400 to the ton. Parker & Boaden on an adjoing lot are taking out rich ore. An assay from the second class ore gave as high as 26 oz., and the first class, which is carefully placed in sacks, is expected to yield $5,000 per ton. The seam varies from 1 in. to 3 in. at a depth of 15 ft.

ELKTON CONSOLIDATED.—The output for December was $75,000 gross; shipments for four cars varied from 19 oz. to 21 oz. per ton. The mine now employs 120 men. The mine produced $230,000 worth of ore during the last quarter of the year, over 50% of which was profit, a very good showing for a property which had been "turned down" by English, French and Californian experts,on a $500-000 basis. The reserves are also large and being increased, and the mine only 400 ft. deep.

GARFIELD GROUSE.—Lessees are working a big force of miners, trying if possible to atone for the time the mine was restrained from being worked by the court. The output is now at the rate of 300 tons a month, 10 tons of which recently sampled at the Cripple Creek sampler at the rate of $1,600 per ton. The lease expires about May 1st next.

GOOD WILL TUNNEL.—The compressor has been erected, and a contract has been let to drive 500 feet. European capitalists have subscribed $50,000 for this tunnel. From the time the compressor plant was ordered until it was at work was less than five weeks.

GROUSE.—This mine, on Bull Hill, employs 22 men, six of whom are at work straightening, enlarging and tunneling the shaft. The grade and quantity of ore are maintained at the normal standard, the first grade assaying from $300 to $400, and the second grade about $40.

HANNAH BRITT.—This claim, located in 1891 on the apex of Bull Hill, is under lease and bond to St. Louis parties, who have erected a steam hoist and sunk a shaft 120 ft., but no shipments are being made. Some hundred tons were shipped to the local mills, but the ore was low grade and did not leave a profit. The lessees are not discouraged and intend to develop to find an ore chute.

LITTLE MAY.—This claim, on Beacon Hill, is being actively worked by lessees. A pump has been purchased to enable the shaft to be sunk an additional 100 ft., making the total depth of shaft 220 ft.

POINTER.—This claim, on Gold Hill, is being worked by some parties from Joliet, Ill. A vertical shaft has been sunk 150 ft., and a crosscut is being driven west to intersect the vein, which is thought to be 18 ft. distant. The shaft has been sunk on a phonolite dike 60 ft. wide in the granite, and the vein lies against the granite. At the 100-ft. level drifts were extended both north and south, the vein having a course N. 15° E., and nearly 100 tons were sent to the Brodie Mill of an average grade of $15 per ton without sorting. The size of the vein varies from 3 ft. to 7 ft., and is largely an altered phonolite. The presence of fluorite in the phonolite is regarded as a very favorable sign of mineral.

RAVEN.—This mine, on Raven Hill, in spite of development on all sides maintains its output, and the grade of some of the ore is increasing. The big tunnel is now in 1,600 ft., and it is anticipated that in two months the tunnel will be under the shaft sunk from near the apex of the hill, and at that point will be 800 ft. deep. The shaft has been sunk 300 ft., and at the 200-ft. level, the south drift shows well, the richest ore yet found in the mine being obtained from that point.

STANDARD.—This tunnel, penetrating Beacon Hill from the west, has been advanced 900 ft. through a very hard granite. The tunnel is for double track.

VIRGINIA MINING AND MILLING COMPANY.—The Lincoln claim, owned by this company, is located in the town of Anaconda, and the lessees commenced work in a cut made by the Midland Terminal Railway on a vein 3 ft. wide, which had the appearance of a blanket vein having a pitch to the north and east, but a little development showed that the vein was straightening itself. The value of the ore is about $70.

FREMONT COUNTY.

METALLIC EXTRACTION COMPANY.—This company, of Florence, on January 11th let the contract for additions to its plant, to cost in the neighborhood of $25,000. The improvements consist of a leaching and roasting building, covering ground space of 60 × 210 ft. Work will be started at once and pushed to an early completion.

ROCKY MOUNTAIN SMELTING COMPANY.—Articles of incorporation have been filed by this company, with a capital of $750,000, by Charles Foster, ex-secretary of the Treasury of the United States; James B. Orman, John Coon, Wilbur K. Johnson and Harry M. Claflin.

The smelter, which will be located upon ground already selected at Florence, will have a capacity of 200 tons of ore a day. The work of the construction of the plant is to be promptly entered upon and ground will be broken immediately. The smelter is expected to treat much ore coming over the Florence & Cripple Creek Railroad to Florence, from the Cripple Creek and intermediate districts. The officers of the company are: Hon. Charles Foster, president; William E. Johnson, vice-president; William Kopfer, secretary; George E. Ross-Lewin, treasurer. The smelter is to be ready for operation in time to receive the spring shipments.

GILPIN COUNTY.

(From Our Special Correspondent.)

GETTYSBURG.—At this property, on Bates Hill, a good ore body is being opened up in the 600-ft. level west.

KATIE.—A good strike of ore has been made in the bottom of the shaft, probably the extension of the pocket worked in the adjoining Carr mine, which is said to dip west toward the Katie.

NOTAWAY.—At the McLeod shaft on this vein, worked by Chicago parties, a good hoisting plant has now been set in place and started to work. At present, however, the only work in progress consists in cutting down and straightening the shaft throughout its whole depth (175 feet). On the old East Notaway a party of local miners are drifting about 150 ft. from the surface on a good-looking vein. The total depth of this shaft is some 500 or 600 ft., but the timbers have gone together in many places, and the bottom is not now accessible. The Notaway vein has been a considerable producer, but mainly of low-grade smelting ore, the less solid portions, although often assaying well, having hitherto been unworkable, as the gold contained will rarely amalgamate, even when, as at the surface, the sulphides are decomposed.

RIALTO EXTENSION.—This claim runs southwest from the well-known Rialto mine, crossing the Union Pacific, Denver & Gulf Railroad. The vein at this end is narrow, rarely much over a foot in width, but assays well, and gives fair results to the lessees employed.

HINSDALE COUNTY.

CRESCO.—At this mine, in Carson Camp, the St. Jacobs vein has been tapped at a depth of 300 ft. The mine is developed by a tunnel about 1,000 ft. long, and where the vein has been cut it is 4 ft. in width, carring about 2 oz. in gold and over $100 in silver, the gross value of the ore being about $150 to the ton. When the St. Jacobs vein was discovered, $100,000 was taken out of the first 100 ft. of the shaft and was hoisted with a windlass.

LAKE COUNTY.

(From Our Special Correspondent.)

FANNIE RAWLINGS.—The lessees of this property encountered a heavy flow of water in their new shaft, which they recently commenced sinking. After vainly attempting to check the rise with their small pumping plant, they were compelled to give up the fight, and have closed down.

PULLING THE MAID OF ERIN PUMPS.—As announced in my telegram last week, the stopping of the Maid pumps was not merely a rumor, but has in reality occurred. On Saturday the big compound pumps in the Maid were closed down and preparations at once commenced to haul them to the surface. This is the first time in fifteen years that the pumps have not been going. They have been handling in all this time from 1,300 to 1,600 gals. of water per minute. The pulling of these pumps will be a great calamity to the Carbonate Hill section, more especially so if the strike contiuues, for then there would be no inducement for any of the other properties in the neighborhood to try, with increased pumping facilities, to handle the enormous flow of water in this territory.

For the past nine months the Small Hopes and the Mahala Mining companies have been paying $5,000 a month to keep the Maid pumps going. It is understood that Mr. Mudd, of the Small Hopes, was unable to renew his lease on the Marian property, and he therefore notified the Smith-Moffat people that he would no longer pay for pumping service. This, of course, threw the entire expense at once on the Mahala Mining Company, and these people, not feeling like bearing such a big expense, also gave notice that they would not pay more than their share. The Smith-Moffatt people quietly prepared to pull their pumps, and by Saturday night not a wheel was moving. The great pumps of the Smith-Moffatt combination have controlled the silver mining situation here since the early days. It has been only through them that deep mining in the section west of the Iron Fault has been possible at all. When the Maid and Wolftone mines gave evidence of exhaustion, the Smith-Moffatt combination presented its ultimatum, which was that the properties benefited by the pumps should bear the expense. The Small Hopes, the Mahala and the Mikado agreed to pay $2,000 per month each to keep the plant in operation. The Mikado was first to quit, the ore body in the lower levels on which they were working having given out. The Small Hopes and the Mahala people continued paying their share until January 15th.

The practical effect of the stoppage of the Maid pumps will be the ultimate submersion of a rich and important section of the silver-lead area. Experience has shown that the action of the water in drowning out the lower levels of the mines will be far more gradual than was at first believed, and it will probably be 90 days before any serious consequences will be noted.

The Mahala and the Small Hopes have their own pumping plants, and will, with their small pumps, be able to keep going for some months to come. Eventually, however, unless some of the other mines on Carbonate Hill place in position a pumping plant equally as large as the one withdrawn from the Maid, the entire Carbonate Hill territory will be submerged in water.

There will be a number of important properties beside the Mahala and Marian affected, and besides this, it will be a serious and probably permanent set-back to all development work in that rich section. The first contact of Carbonate Hill is practically abandoned, and for the last few years Leadville has been bending her energies to the deeper contacts below the water level. The flooding of the Carbonate Hill basin means a cessation of all this. The Moline Mining Company, which has just sunk the William Wallace shaft 900 ft. and commenced drifting, will probably close shortly, while the Mab, Rialto and the Pyrenees have already closed down. The rise in the water level will also affect quite a number of the downtown properties.

The outlook at this writing is very gloomy. The only hope is that some of the other properties may put in a pumping plant which will take the place of the Maid. Should there be no settlement of the pumping question within the next six months, and the water is allowed full sway, there will not be a property working west of Iron Hill by August 1st.

OURAY COUNTY.

(From Our Special Correspondent.)

BACHELOR.—A contract for running a 275-ft. upraise, connecting the upper and lower levels, has been let to Morrison & Smith. The contractors are running three shafts of eight hours, and have driven 70 ft. through good ore. The contract will be completed about March 1st.

BRYAN.—Messrs. Joseph and others have discovered a large body of lead ore carrying considerable values in silver, and are steadily shipping large quantities to the valley smelters.

CALLIOPE.—A rich strike has been made in the lower workings, which promises well. The force has been been increased by almost one-half and the new mill is kept running at its full capacity.

CASANOVA.—A 100-ft. contract has been let to Chris Hohl, which will carry the tunnel to ore. Adjoining claims are shipping considerable high-grade ore.

CASCADE.—A carload of rich ore was shipped during the week of January 10th by lessees. The value in gold reached a high level.

CIMARRON.—Thirty-five men have been thrown out of employment by the closing of this property. No reason is given for the shut-down, as the property abounds in excellent ore.

CONGRESS.—The force has been increased to 18 men, who are working on first-class ore, stacking the bins for spring shipments.

GRAND VIEW.—This old property has resumed work with a force of ten men, under lease to D. B. Boyer. The product will be sent to the Bright Diamond mill.

HUDSON.—This property, at Red Mountain, is being sunk an additional 100 ft. under contract.

HYBRIDGE.—A strike of rich ore has been made by Cannavan & Kennedy, consisting of a 4-ft. vein of fine milling ore, and an 8-in. streak of gold quartz assaying very high. The Hybridge is one of a group of claims situated in the Sneffels district. Mr. Cannavan has just closed a deal, whereby he disposes of one-sixth interest in a small area of contiguous property for a large sum. He recently refused a cash offer of $20,000 for one-sixth interest in the Hybridge.

PARK COUNTY.

BULLION.—A rich strike of ore has been made in this mine, situated on Mount Lincoln. The mine was idle for the past 10 or 15 years, but the owner, Mr. Brockett, recently commenced work on the property, with the result that he has opened 5 ft. of ore, 2 ft. of which is solid and very rich. It is a vertical vein in the sedimentary rocks adjoining porphyry dike, and carries both gold and silver. The property adjoins the Calumet & Hecla and is near the Present Help and Gertrude mines, which cross the pinnacle of Mount Lincoln, with the Moose and Dolly Varden mines to the south, and is in sight of the town of Alma.

SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

CARRIBEAU & MONTEZUMA.—These mines are near the town of Ophir and are owned principally by the Newtons, of Holyoke, Mass. Chas. S. Newton is manager and resides at Ophir. They are extensively developed and several sets of lessees are working in different parts of the property. George Wearing, formerly foreman of the Smuggler-Union, and Wm. Southcomb have a lease on the upper workings of the Montezuma, and are making shipments at regular intervals. The ore yields $60 per ton in gold, silver and lead. The Carribeau & Montezuma Company is also working the mine in addition to the lessees. Mr. Newton had 10 stamps put up, which are dropping on ore coming from the drift on the Carribeau vein, and also from the levels on each side of the 700 ft. upraise connecting the lower and upper workings.

CLIFT GROUP.—This group in Saw Pit, adjoining the Belle-Champion, is again undergoing development work by ex-Sheriff Burchinell, of Arapahoe County, and other Denver parties, who have leased and bonded the property from Carhart and Conkling. R. E. McCarthy is manager, and is now sinking an inclined shaft on a claim, called the Master. It is down 90 ft., and while large chunks of rich mineral have been encountered in the upper stratas of the lime formation it will be sunk deeper to the main lime formation. The ground around where the ore was taken out will be prospected meanwhile.

COLUMBIA-MENONA MINING AND MILLING COMPANY.—This company owns 4,250 contiguous feet on one of the largest and best-defined veins in the district. The properties lie in the Savage basin in the vicinity of the Tom Boy. The lead carries from 2 ft. to 6 ft. of gold, silver and lead ore, and last year, until November 20th, when water for milling purposes gave out, the mine produced from 100 to 110 tons of mineral a day, which was concentrated at the company's 30-stamp mill, connected with the mine by a single-bucket aerial-gravity tramway. The ore was concentrated from 8 to 10 tons into one. A tunnel, called the mill crosscut, which has been under way for a couple of years, is now fast nearing completion. According to surveys only a few feet remain to be driven. It is about 1,400 ft. in length and cuts the vein 450 ft. below the lowest level in the upper workings. An upraise will be driven from the intersection to the upper workings and stoping ground blocked out on each side of the raise as rapidly as it can be done. The management is talking of enlarging the mill to 60 stamps, and next spring a pipe line 30,000 ft. long will be laid from Green Lake, in Bridal Veil basin, to the mill, which will furnish an abundant supply of water perennially. Most of the stockholders live in New York; I. E. Ackerley, president, residing in Olean, and A. Miner Wellman, treasurer, at Friendship. R. I. Thompson has been appointed agent of the company in Telluride.

FLORIDA.

PHOSPHATE SHIPMENTS.

The shipments of Florida phosphates for the year ending December 31st are reported as follows, in long tons:

	1895.	1896.
Foreign	425,705	409,288
Domestic	110,672	147,581
Total	536,377	547,869

The shipments by ports in 1896 were as follows: Fernandina, 129,268 tons; Port Tampa, 161,258; Punta Gorda, 74,641; Savannah, 97,040; Brunswick, 40,562; railroad shipments, 33,000; consumed in Florida, 15,000; total, 547,869 tons. The year 1896 therefore showed a slight increase—11,492 tons, or 2.1%—over 1895.

IDAHO.

IDAHO COUNTY.

(From an Occasional Correspondent.)

Recent discoveries of high grade gold-bearing veins have developed a tunnel project to thoroughly explore and drain the basin of Florence. This project is being incorporated with $25,000,000 capitalization to drive a tunnel from the Salmon River breaks, a distance of four miles, to cut the formation. The first ledge will be cut at about 500 ft., and from surface showings a vein will be cut in every 500 ft. thereafter. The ore is all good grade and will pay to mill from the start. Power will be obtained from the Salmon River to run the compressors for the machine drills, and also for the sawmill and electric plant. Timber is abundant for mining purposes. The State wagon road passes within a short distance of the tunnel site. All claims on the line of the tunnel are being turned into the company for stock. Florence basin lies at an altitude of 6,400 ft. above sea level, and the Salmon River channel is 5,000 ft. lower; the tunnel will start from a point which will give a mean depth of 3,000 ft. The gold is found in its native state in the superficial workings, but as depth is attained it is associated with iron pyrites. Most of the Florence ore carries a large amount of free-milling silver, but with the present machinery very little of its silver values are recovered.

OWYHEE COUNTY.

DE LAMAR MINING COMPANY, LIMITED.—Mr. D. B. Huntley, the manager of these properties at De Lamar, reports as follows, for the month ending November 30th, 1896: Crushed (wet), 4,196 tons; crushed (dry), 3,776 tons; assay value of pulp, $19 37, of which $15.57 was gold and $3.80 silver; assay value of tailings, $5.03, of which $4.17 was gold and 86c. silver; percentage saved, total, 74·03%. Doré bars produced, 14; number ounces pure gold produced, 1,650; number ounces fine silver produced, 18,917; value of gold produced, $33,000; value of silver produced $12,296; surplus realized from bullion, $1,505, ore sales, $5,700; miscellaneous revenue, $125; total receipts, $52,727; expenses, $40,493; estimated profit for the month, $12,234. The following is the return reported for the month of December: Crushed ore during the month, 4,422 tons; bullion produced in the mill, $46,097; estimated value of ore shipped to smelters, $2,500; miscellaneous revenue, $450; total produce, $49,047; total expenses, $41,380; profit for the month of December, $7,667. The directors announce that the earnings for the quarter ending December 31st, 1896, do not permit of the declaration of a dividend for that period.

KANSAS.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

CROWN POINT COMPANY.—This company is running its plant steadily and last week made 116,400 lbs. of zinc ore. They are drifting in two drifts at 115 ft. on a large face of zinc ore in shooting ground.

DEGRAFF BROS.' LEASE.—In sinking a new pump shaft, they passed through 15 ft. of lead ores, from 45 to 60 ft. This shaft is 80 ft. northwest of the Old Virginia mine. At their other pump shaft they are drifting at 115 ft. on a rich run of lead in soft ground, and last week on hand jigs cleaned up 22,570 lbs. of lead ore. At the Old Virginia mine they are drifting at 120 ft. on a large face of zinc ore, and last week sold 110,600 lbs. of zinc ore. The dirt from this mine is so rich that nearly half of it is ready for market as soon as it is hoisted out. Miller & Company are drifting at 110 ft. and turned in 33,490 lbs. of zinc ore and 3,840 lbs. of lead ore. Sweitzer & Company turned in last week 50,130 lbs. zinc ore and 1,430 lbs. of lead ore.

FRIEND & COMPANY.—This company has a 40-acre lease of the Murphy land, north of Empire City. The early prospecting on the ground was not fruitful, but during the past two months several strikes have been made. A 6-in. lift pump easily handles the water and there is no trouble in sinking a shaft. Evans & Jarvis made a big strike on this lease Christmas eve and it has improved ever since. The ore was struck at 40 ft., on the part of the lease ignored by other prospectors, and the lots near them are being taken up. Ellis & Mecardel have a shaft down to 106 ft. in zinc-bearing dirt that will pay to wash and also have better ore in the bottom of their shaft.

GRANT & COMPANY.—This company has opened up a rich prospect at its shaft on the North Empire lease and has started to drift at 75 ft. on a large face of ore.

GRAY EAGLE COMPANY.—They are drifting at 85 ft. on large face of lead dirt in open ground, and last week turned in 29,840 lbs. of lead that was cleaned up on hand jigs from their new shaft.

GRISWOLD & COMPANY.—A lead strike was made at 80 ft. that is very good. They are sinking the shaft on a drill hole that showed lead at 90 ft. and zinc ore at 103 ft. They are now down 95 ft. and are sinking for the zinc indicated. Other shafts are going down with promising indications.

G. W. STEVENS.—The editor of the *Galena Post* made a rich strike of zinc ore near the center of his 9-acre lease of the Brinkerhoff land, adjoining the State line. The drill has been moved west to put down more holes, and as soon as he strikes more ore he will sublease lots to miners to sink shafts.

NORTH EMPIRE COMPANY.—A half interest in two lots on the company's lease has been purchased by Geo. Hurl from F. Nimerach and W. Applegate for $1,600. The lots are 35 and 34, and on the latter is located the Pittsburg mine, while on 33 a new shaft is nearly to ore close to the south line, where the April Fool Company drove a face of rich ore over to lot 33.

O'NEILL LEASE.—Col. Jas. O'Neill, of Webb City, is prospecting a 320-acre lease southwest of Galena, with four steam drills. With one, a 20-ft. face of zinc ore was developed at 150 ft. and another is in ore at 122 ft.

SILVER DICK COMPANY.—This company is drifting at 105 ft. on a large face of zinc ore in open ground, and last week on hand gigs cleaned up 37,310 lbs. of zinc.

UNION MINING COMPANY.—This company is running the plant steadily, and last week made and sold 85,500 lbs. of zinc ore, and 57,640 lbs. of lead. They are hoisting dirt from two shafts, and are drilling at 87 ft. on a large face of lead and zinc ores in shooting ground.

WALCH, PHARES & COMPANY.—This company has not been working in its mine on Tennessee Prairie, four miles south of Galena, on account of having to put in an 8-in. lift pump to drain the ground and will start up in a few days. There is ore in the shaft from 68 ft. to 94 ft., and it is still richer in the bottom and will go through the ore before starting to drift.

MICHIGAN.

COPPER.

ATLANTIC MINING COMPANY.—This company has declared a dividend of $1 per share, payable February 10th, to stockholders of record on January 30th. The last dividend paid was in February, 1891. The present payment will require $40,000, and will make a total of $740,000 paid up to date.

CENTENNIAL MINING COMPANY.—On January 13th the pumps were started in No. 6 shaft of the Centennial mine. As rapidly as the unwatering of the levels makes places for them, miners will be put to work, until 300 are employed. The mine has been idle since August, 1892. The shaft is 635 ft. deep, and it is expected that about a month will be required to clear it of water.

MINNESOTA.

(From Our Special Correspondent).

The State Legislature of Minnesota has begun its investigations of the facts as to the way in which the title of the lands on which the Mountain iron mine is situated came to be secured by the appointment of one of the strongest and most honest-intentioned committees it could have selected. The senate will follow suit this week and the investigation will then proceed. There seems to be little to investigate but the mere question of law, has the State auditor the power to transfer land from the State school funds after this land has come into the possession of the State; did a rule of the general land office, put into effect after these lands had become State property, make necessary a change in the form of entry of any lands taken prior thereto, and if so, why not all and the strength of averse possession. The State constitution says the auditor has no right to transfer school lands, and that they cannot pass out of the name of the State except by sale and the signature of the governor, and it will scarcely be contended by any one in a sane moment that under rulings of the land office lands taken in due form under preceding rulings must conform to the new rulings. The adverse and undisputed possession for a long term of years by the defendants and their predecessors forms an important claim.

Not since 1892 has there been so much exportation going on along the Vermilion Range, especially east of Ely, as now. Several of these are developing into mines, and should the season of 1897 prove satisfactory there will be some good new mines about Ely within the coming year.

AINSLEY LAND AND MINING COMPANY.—Suit has been brought by this company, owner of the fee of the land on which is located the Ohio mine, for the cancellation of the lease to the latter company, and for $5,000, claimed to be overdue on the royalties for ore mined and shipped the past season. The Ohio Mining Company agreed to mine a minimum amount of 80,000 tons a year, and to pay a royalty of 25c. a ton, which it is alleged to have failed to do, also failing in numerous other agreements, it is recited. The Ainsley Company has entered and taken the mine and now wants a judicial cancellation of the lease. The Ohio property is a very valuable one.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

CHANDLER IRON COMPANY.—This company is now raising about 40,000 tons of ore monthly, and

nearly all of its highest, or Chandler grade. It has at this time 185,000 tons of ore in stock, of which 150,000 tons are Chandler; 400 men are employed, and some considerable deadwork is being done. Shafts 2, 3 and 4 are now down 500 ft., while No. 5 is to the 8th level and will be sunk 112 ft. more, work beginning this week.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The weather of the past week was fairly good for mining, for although it rained about half the time it was warm enough to clean ore with hand jigs. The sales of zinc ore fell short of the preceding week 30 carloads and were 11 less than the corresponding period last year and a surplus of over 1,500 tons of zinc ore was left unsold. The lead ore sales increased 14,000 lbs. over the previous week and were 62,260 lbs. larger than the same week in 1896. The highest price paid for Joplin ore was $23 per ton for one car load; another at $21.50 and two at $21. Four carloads of Webb City ore sold at $21 and two carloads at Galena, Kan., the other grades ranging down to $16 per ton. The bulk of the Oronogo output and a carload from Scott City brought $21 per ton. The highest price paid the corresponding week last year was $24.50 per ton for two carloads. Lead ore brought $15.50 per 1,000 lbs. in the bins all week and $16 delivered at the Joplin smelters. Last year during the corresponding period it brought $17. The following were the sales of lead and zinc ore in the different camps: Joplin zinc, 1,041,140 lbs.; lead, 236,580 lbs.; value, $14,198. Webb City zinc, 303,390 lbs.; lead, 66,110 lbs.; value, $3,953. Carterville zinc, 642,700 lbs.; lead, 215,850 lbs; value, $9,680. Galena, Kan, zinc, 2,210,000 lbs.; lead, 514,710 lbs.; value, $27,009. Aurora zinc, 365,000 lbs.; lead, 30,000 lbs.; value, $3,377. Oronogo zinc, 113,740 lbs; lead, 6,340 lbs.; value, $1,180. Stott City zinc, 43,430 lbs.; value, $456. District totals for last week: Zinc, 4,849,400 lbs.; lead, 1,062,890 lbs.; value, $59,853. District totals for two weeks in 1897: Zinc, 11,027,600 lbs.; lead, 2,111,510 lbs.; value, $134,346.

AITER & ROGERS.—On the Ragan land south of Carterville, they have opened up a large body of ore at 70 ft. in open ground and are turning in large quantities of both lead and zinc ore.

DURHAM LEASE.—This is R. B. Cholmondeley's lease on the Rex land, on which there are now four producing shafts. The Flynn Bros. have finished their new shaft to the ore level, and are now cutting a face of ore at 65 ft. Blinzler, Rush & Company are getting zinc and lead ore at 74 ft. in soft black ground. The Five Burns are drifting at 65 ft. and are making 7 tons of zinc ore and 3,500 lbs. of lead weekly. Scuggs & Company have sunk 10 ft and are now drifting at 75 ft.

MONTANA.

DEER LODGE COUNTY.

BLUE-EYED NELLIE.—George Gunn and P. D. Twohy, of Anaconda, have secured a lease and bond on this claim, near Anaconda, from its owner, Frank D. Brown. The bond is in the sum of $50,000, and the lease runs for two years. The mine was a famous silver producer in years past. It is in a lime formation, and the ore was found in rich chambers. After nearly half a million dollars had been taken from it the rich pockets were exhausted, and although several efforts have been made to open up new chambers, the results were unsuccessful. The main shaft of the mine is 340 ft. in depth. A 60-ton smelter is on the ground, but was little used. The lessees will work about six men.

GALLATIN COUNTY.

A new mining enterprise in the Gallatin Valley is the opening up of a vein of oynx by Charles Logan 4 miles north of Manhattan. A few slabs of the oynx, 1¼ in. thick and a foot square, have been cut in which the colors are bright and clear, almost transparent, and the markings are odd and beautiful. This vein upon the surface is said to be 100 ft. wide and extends for three-eighths of a mile along the bluffs north of Manhattan.

GRANITE COUNTY.

GOLD COIN MINING COMPANY.—The new 10-stamp mill of this company, near Silver Lake, recently commenced crushing ore. The new superintendent is Mr. Morgan, who was sent out by Fraser & Chalmers to supervise the construction of the mill. A new ore bin is being built at the mine.

MEAGHER COUNTY.

FLORENCE.—This mine, at Neihart, has just declared its January dividend of 1c. per share or $3,606. To date total dividends paid amount to $118,096. The company has secured the Monarch group of mines adjoining, comprising three claims, for $25,000. Forty men are now at work and considerable high-grade silver ore is in sight.

SILVER BOW COUNTY.

(From Our Special Correspondent.)

BOSTON & MONTANA GOLD, SILVER AND COPPER MINING COMPANY.—It is reported that all the works at Great Falls, including concentrator and furnaces which have been idle for about three months, have restarted and will be run to their full capacity, as it is expected the company will, on February 1st, give up the Butte & Boston concentrator and smelter which it is at present operating. At the Atlantic sinking is in progress from the 600 to the 800-ft. level.

NEW JERSEY.

MORRIS COUNTY.

NEW JERSEY IRON MINING COMPANY.—For some time past this company has been drifting in the foot wall on the east side of the offset which separates the new slope from the Hurd mine, at Port Oram, hoping to cut the main Irondale vein. After drifting a distince of 80 ft. they were rewarded for their trouble and expense by cutting a 10-ft. vein of fine ore. This is at a depth of 900 ft., and has never been discovered before east of the offset. L. C. Bierwirth, general agent and mining engineer, and Edwin Mill, mine superintendent, have directed the work to such a successful termination. The ore is of a good quality. This discovery of iron ore by this company will in all probability be the means of causing the owners of the Orchard mine, which adjoins this land, to commence operations again by drifting and doing other necessary work, as this vein probably crosses their property and also several others in that locality.

OREGON.

BAKER COUNTY.

WHITE SWAN MILLING AND MINING COMPANY.—This company, with headquarters at Des Moines, Ia., assigned January 13th. Its mines are at Baker City. The company has $1,000,000 authorized capital, and failure is attributed to bad management. It is expected the stockholders will buy up the claims and resume business. The creditors are located in New York and Iowa towns.

JOSEPHINE COUNTY.

JOSEPHINE MINING COMPANY.—This company was incorporated recently with a capital stock of $50,000, and the incorporators are T. W. Sullivan, Franklin D. Griffith and Charles P. Thore. The principal place of business will be in Oregon City.

PENNSYLVANIA.

ANTHRACITE COAL.

GIRARD.—A heavy squeeze occurred at this mine, near Shamokin, on January 14th, and the colliery had to be shut down for an indefinite time. The surface is settling perceptibly, but no serious results are anticipated.

NEWTON COAL MINING COMPANY.—The work of mining coal in the Twin Shaft mine of this company, Pittston, which has been idle since the disaster last June, was resumed January 18th, though only in a small way. There was a block of coal on the east side of the shaft which was never affected by the squeeze, and this is the portion of the mine where work has been started. Two gangways have been opened and the coal will be sent to Seneca Breaker.

BITUMINOUS COAL.

COAL LAND SALES.—Henry Cronshire, president of the First National Bank at West Newton, has sold 944 acres of coal and 15 acres of surface lying along the left bank of the Youghiogheny River opposite West Newton, netting in the neighborhood of $950,000. The purchasers are Osborne, Saeger & Co., large owners of property in that vicinity.

SOUTH CAROLINA.

PHOSPHATE RETURNS.—The State Board of Phosphate Commissioners met in Columbia, S. C., recently, to consider the report of Phosphate Inspector A. W. Jones and the petition of the river-rock miners for a reduction of the royalty to 25c., with an ascending scale, if prices get better. The board considered the petition for a reduction of royalties, and referred all the papers to the General Assembly without recommendation. Mr. Jones, in his report of operations for the year ending August 31st, 1896, gives the following-named companies and individuals as engaged in mining and shipping rock during the year: Coosaw Company; Farmers' Mining Company; Beaufort Phosphate Company; W. Y. Tripp; James Reid; Carolina Mining Company, and John C. Nelson. The total amount of rock mined during the year ending August 31st, 1896, is estimated at 123 708 tons, as against 196,777 tons for the previous year, showing a decrease of 73,039. The total number of tons of rock shipped during the year was 121,602 tons, being a decrease from that of the year 1895 of 52,797 tons. The amount of State royalty for the year ending August 31st, 1896, was $60,854. Of the rock shipped or sent to market, 93,527 tons were foreign, 11,257 tons coastwise, 5,017 tons taken at Charleston, 11,801 tons at Beaufort or Port Royal.

SOUTH DAKOTA.

LAWRENCE COUNTY.

FLORA.—In this group, at Ragged Top, several hundred pounds of ore have been taken out and sacked, valued at $2,400 to the top. The find was made at a depth of 55 ft., and in the same character of lime rock as all the Ragged Top ores.

UTAH.

BOX ELDER COUNTY

HOUSLEY.—At this mine, in Three Mile Creek canyon, four miles southeast of Brigham, the tunnel is now to a depth of 38 ft. About two months ago an assay was made of ore which showed $9.80 to the ton. Recently another assay was made in Salt Lake, with the following result: Gold, $5.40; silver, $2.78; copper, $2.10. The owners of the mine are Frank Housley, Carl Crowther and others.

SALT LAKE COUNTY.

HIGHLAND BOY GOLD MINING COMPANY.—This company has been incorporated, with a capital stock of $250,000, by Herman H. Campbell New York City; William C. Taylor, Brooklyn; Wilson P. Morchbank, Newark. The office of the company is in Jersey City, N. J., with a branch office in Salt Lake City. The mines of the company are at Bingham.

SAMPSON MINING COMPANY.—The Yosemite No. 2 mine at Bingham has been purchased by this company, the consideration, it is said, being about one-half of the 500,000 shares of the Sampson Company, so that the transaction was in effect a consolidation. A. E. Hyde remains at the head of the company, with J. A. Cunningham vice-president and R. J. Glendinning secretary.

SEVIER COUNTY.

BUTLER-BECK.—This mine has been sold to Judge W. W. Wallace, of Richfield, for $8.578. It is one of the oldest and best-known mines of Gold Mountain. The Butler-Beck group comprises eight claims, called the Carrie, Tennessee, Tesora Lode, Buck Horn, Dream, High Five Amended, Crosscut Carrie and Dove. Upon the premises are built a 5-stamp mill, boarding-houses, bunk-houses and an assay office; all these with the tools, water rights and other fixtures are included in the sale. Upon the several claims about 1 000 ft. of development work has been done. The largest vein is 5 ft. wide and is said to assay $12 gold, 2 to 5 oz. of silver. The new owner announces that he will commence active operations in the spring.

WASHINGTON.

PIERCE COUNTY.

TACOMA SMELTING AND REFINING COMPANY.—This company's product for the month of December, 1896, was 5,100 bars bullion, weighing 523,436 lbs., and copper matte, weighing 241 400 lbs., containing 1,876.24 oz. gold, valued at $38.781 88; 48.667 oz. silver, at 65½c. per oz., valued at $31,755.22; 558,436 lbs. lead, at 2·80c. per lb., valued at $15,636 21; 64.783 lbs. copper, at 11c. per lb., valued at $7,126.13; total, $93,249 44. The number of men employed was 63, and the pay-roll was $5,208.91, and for wood-choppers and teams, $632.80, a total of $5,841.71.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

LILLOOET DISTRICT.

(From Our Special Correspondent).

GOLDEN EAGLE.—This free milling proposition at Lillooet, said to be the richest mine in British Columbia, in getting out ore for a crusher which was be erected, it is expected, by February.

SLOCAN DISTRICT.

(From Our Special Correspondent.)

GALENA FARM.—This silver property comprises seven claims. It was bought from the original owners on a $50,000 option. It has now been sold to an English syndicate for £500,000, one-twentieth in cash and the balance in stock of the new company. According to the report of Mr. Callahan, the company's mining engineer, the ore will produce on an average 60 oz. of silver and 40% lead, and on a daily output of 37 tons hand sorted and 150 tons concentrating ore, basing calculations on 250 working days to the year, a net profit of over £250,000 per annum could be obtained.

TRAIL CREEK DISTRICT.

(From Our Special Correspondent.)

LE ROI MINING COMPANY.—The new ore bin of this company will have a capacity of 100 tons, equal to five cars. It is the intention of the management to load this quantity at one time over the Red Mountain branch of the Spokane & Northern Railway.

WAR EAGLE.—The sale of this property to a Toronto syndicate is still affirmed by the local reports. The figures now given are $800,000. It is stated that both buyers and sellers consider the reported sale a private concern until the details are finally settled and the transfer completed, when the particulars will be made known.

WEST KOOTENAY DISTRICT.

(From Our Special Correspondent.)

ORE AND MATTE SHIPMENTS.—The value of the ore and matte shipped from West Kootenay for December, 1896, amounted to $481,200. This is exclusive of ore and concentrates shipped by way of Naksup and Revelstoke. In December, 1895, the value of the ore shipped was $96,947, and bullion $19,774, making a total of $116,173. The shipments for last December quadrupled.

YALE DISTRICT.

(From Our Special Correspondent.)

OCCIDENTAL MINING COMPANY.—The first general meeting of this company was held in Vancouver recently, and directors appointed. The sale of a limited number of treasury shares was authorized at 10c., for the purpose of raising money to develop the Mayflower, one of the company's claims. A shaft on this claim is down 50 ft. and the ore, which is free milling, runs from $60 to $90 per ton at that distance. The company owns two other claims, the Bootblack and the Occidental, all situated at Fairview.

QUEEN.—Work has been shut down on this gold and silver mine owing to snow. The mine is situated a mile and a half from the town of Yale, on the line of the Canadian Pacific Railway. Abundant assays have been made and the rock runs in every instance over $100 in gold, silver and zinc. The mine, which is said to be one of the earliest discovered in the Province, had not been worked until lately.

BRITISH GUIANA.

GOLD EXPORTS.—Exports of gold from the colony for the year, up to December 21st, amounted to 115,644 crude ounces, equivalent to 99,438 fine ounces. This is an increase of 3,270 crude ounces over the corresponding date in 1895.

FRANCE.

Attention has been called recently in France to a newly-discovered deposit of phosphates near Carentan, in Normandy, in a district known as the Ile de Brevands. The term, newly-discovered, is perhaps incorrect, since the existence of the phosphates has been known for a long time to the people of the district, although it is only very recently that attention has been called to it and workings have been begun. The deposit is found on a small plateau about 30 m. above the level of the sea and very near the coast. The deposit is covered by a layer of soil varying in thickness, but seldom reaching 1 m. The phosphate is found in the form of nodules, scattered through a thick and tenacious clay. The bed varies in thickness, but has an average of 2 m. The present working consists in stripping off the soil and sending the phosphate-bearing clay in wagons to a washer where the nodules are separated from the clay and pebbles. Some analyses and practical trials have been made of these phosphates, showing them to be of a high grade. It is proposed to examine the beds and to extend the workings.

GREAT BRITAIN.

WALES.

PENRHYN SLATE QUARRIES.—The labor troubles at these quarries, which include all the large workings in the district, and practically control the English slate trade, have culminated in closing of the quarries. Lord Penrhyn, the chief owner, has finally refused to negotiate any longer with the Quarrymen's Union.

SOUTH AFRICA.

CAPE COLONY.

CAPE PETROLEUM AND MINERAL ESTATE COMPANY.—At a recent meeting of the stockholders in Kimberley a report was read from the American mining engineer engaged, stating that on the company's farms all the geological conditions favorable to a strike of oil were fulfilled, and recommending the sinking of a large well at a certain spot. The scheme of reconstruction was agreed upon by the flotation of a new company with a capital of £175,000 in £1 shares, of which 75,000 go to the present company as vendors, 37,500 shares to purchasers in consideration of £15,000 working capital, the remainder to be held in reserve. The company owns several farms in the Ceres District.

TRANSVAAL.

The State mining engineer's statistical report for the third quarter of 1896 shows that the total number of tons mined was 1,321,919 tons, as against 1,190,692 for the second quarter; the number of meters sunk being 17,817, as against 14,833 for the previous period; and the total number of meters driven is given at 45,460, as against 43,745. For the Rand district, including Boksburg, Krugersdorp, Florida, Doornkop and Blaauwbank, the figures are: Tons mined, 1,232,349; meters sunk, 13,562; meters driven, 33,445, showing that the number of tons mined on the Rand is about 83% of the whole country. The total number of tons treated in the Transvaal was 1,159,381, as compared with 1,106,886 for the quarter April-June, of which the Rand dealt with 1,102,587 tons, as against 1,010,966 for the earlier period, the average per stamp per diem being 4·43 tons. The outside districts were responsible for: Heidelberg, 6,389 tons; Klerksdorp, 12,786, of which 868 tons were crushed dry; Barberton, 21,811 tons; Zoutpansberg, 1,289 tons; Lydenburg, 13,437 tons; other places, 1,132 tons.

The gold won by amalgamation for the two periods was for the whole country 429,363 oz., or 0·37 per ton; of this 401,951 oz., or 0·36 oz. per ton, was from the Witwatersrand. The total tonnage of tailings treated was 834,015 tons, of which 792,929 tons were in the Rand. Of the latter 719,098 tons were treated by cyanide and 73,837 oz. by the Siemens-Halske process. There were 9,188 tons of concentrates treated, 5,374 tons by cyanide and 3,814 tons by chlorination. The total gold obtained in the Transvaal during the quarter was 662,674 oz., of which 611,162 oz. came from the Witwatersrand. The number of men employed during the quarter was: Whites, 9,744; colored, 71,148; total, 80,892. Of these 8,305 whites and 63,984 Kaffirs were employed in the mines, and 1,431 whites and 7,140 Kaffirs in the mills; while employed on alluvial diggings there were 8 whites and 24 natives. The labor employed on the Rand, as compared with the whole country works out at 85% of the native labor and 87% of the white labor. The only alluvial returns are from De Kaap, 50 oz.; Pilgrim's Rest, 105 oz.; total, 155 oz., an insignificant amount as compared with the total.

SPAIN.

MINERAL IMPORTS AND EXPORTS.—Imports of fuel into Spain for the 11 months ending November 30th are reported by the *Revista Minera* at 1,331,396 tons of coal and 221,329 tons of coke. Imports of metals included 8,478 tons pig iron, 13,078 tons wrought iron, 25,320 tons of steel and 890 tons of tin plates. Exports of mineral for the 11 months were, in metric tons:

	1895.	1896.
Iron ore	4,700,274	5,907,482
Copper ore	483,845	593,462
Lead ore	8,556	6,147
Zinc ore	27,269	32,305
Salt	206,713	231,485

Exports of metals included 21,975 tons of pig iron, a decrease of 624 tons from the previous year; 26,261 tons copper, a decrease of 3,037 tons; 149,476 tons of lead, an increase of 10,485 tons.

LATE NEWS.

ILLINOIS COAL MINERS.—The miners in the Braidwood District have stopped work, pending a general meeting to be held at Coal City. A settlement is considered improbable.

IOWA COAL MINERS.—The coal operators in the Des Moines District have asked the miners to accept a reduction in wages from 80c. to 50c. per ton. The miners have refused, and a general shut-down is expected.

EL PASO REDUCTION COMPANY.—This company has closed a contract with the Stearns-Roger Manufacturing Company, of Denver, Colo., for a 150-ton chlorination plant to be put up at Florence; also for two 40-ft. Pearce roasting furnaces. The Stearns Roger Company's improved crushing rolls will be used.

BY TELEGRAPH.

(From Our Special Correspondent.)

LEADVILLE, Colo., January 22.—The proposition made by the mine managers through Governor Adams to pay a sliding scale—$2.75 per day whenever silver goes to 70c. per oz., and $3 when the price reaches 75c.—has been finally and definitely rejected by the Miners' Union. Arbitration is demanded by the Union. The Governor has returned to Denver and no further attempt at settlement will be made.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Jan. 22.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending January 16th, 1897, compared with the corresponding period last year:

	1897. Week.	1897. Year.	1896. Year.
Pennsylvania Railroad	83,100	226,870	205,283

PRODUCTION OF BITUMINOUS COAL in tons of 2,000 lbs. for week ending January 16th, and for years from January 1st, 1897 and 1896:

Shipped East and North:	1897. Week.	1897. Year.	1896. Year.
Allegheny, Pa.	42,227	122,541	139,485
Barclay, Pa.	†656	1,158	2,766
Beech Creek, Pa.	†65,327	116,327	138,585
Broad Top, Pa.	8,207	16,834	25,956
Clearfield, Pa.	226,870	354,503	330,312
Cumberland, Md.	52,450	129,937	.....
Kanawha, W. Va.	156,298	156,298	164,310
Phila. & Erie	‡864	7,023	2,756
Pocahontas Flat Top	.....	.....	63,347
Totals	552,899	904,618	867,517

† For week ending January 14th.
‡ For two weeks ending January 14th.

Shipped West:	1897. Week.	1897. Year.	1896. Year.
Monongahela, Pa.	19,286	48,706	50,353
Pittsburg, Pa.	32,148	101,138	111,832
Westmoreland, Pa.	31,570	92,536	129,264
Totals	82,984	252,380	291,449
Grand totals	635,883	1,156,998	1,158,966

Production of coke on line of Pennsylvania Railroad for the week ending January 16th, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 83,244 tons; year, 195,786; to corresponding date in 1896, 274,238 tons.

Anthracite.

In our report last week we referred to the attempt that was to be made by the producing interests in their "new agreement" to obtain the July circular of prices for the various sizes of coal. Before the *Journal* reached its readers this "understanding" had been decided upon, and now has been in force a week. It is too soon to pass opinion as to the success that may result from this new stand taken by the producers, and how they are going to adhere to it. Reports are already heard in some quarters that the circular is not being obtained, but that report may be without foundation in fact, and we hope, for the welfare of the producers, that there is no truth in it. Considerable stress is laid by some upon the restricted output of 5,000,000 tons for January and February as being an indication that the interests are in earnest in their latest move. It would have been a much better policy, and one that was urged by some companies, to make the output for the two months mentioned 4,000,000 tons, and give opportunity to work off some of the large stocks of coal now on hand. With the visible supply gone, or at any rate greatly reduced, the consumers would go shopping in the market and at once find an absence of the cutting that they have had no difficulty in obtaining for months past. What actual good is to result from restriction so long as the output and stocks on hand combined are greater than the market can absorb? Under these conditions the temptation to shade prices is just the same as it was during last summer and fall, and if they yielded to temptation then, will the mere renewal of an agreement already in existence then be sufficient to resist the temptation now? Time will tell.

To show the large stock of coal that some of the companies have on hand, we refer to the recently published report of the Lehigh Valley Railroad and Coal Company, which shows that the stock of coal on hand at the end of their fiscal year (November 30th, 1896) was of a value greater than in 1895 by $1,326,715. It may be said that the stock of coal now held by that company is not what it was on November 30th, which can be accepted as true, but remembering the output since that time and the market conditions that existed since then, it does not seem probable that the decrease is very much. Some remarks on this report will be found on our editorial page. Business at the present time is naturally almost at a standstill, for no one is going to send in orders, except for coal that is absolutely needed, knowing that higher prices will be asked and, no doubt, insisted on. Of course deliveries are being made, and must continue for some time, on orders accepted before the shading policy was set aside. We note a number of fair-sized orders, taken at the July circular. These are $3.75 for broken, $4 for egg and chestnut and $4.25 for stove.

NOTES OF THE WEEK.

The following directors were elected at the meeting of the Lehigh Valley Railroad Company, held January 19th: President, Elisha P. Wilbur; directors, Charles Hartshorne, William L. Conyngham, Wm. A. Ingham, Robert H. Sayre, Jas. I. Blakslee, John B. Garrett, Chas. O. Skeer, Beauveau Borie, Joseph Wharton, Thos. McKean, Geo. H. Myers, Eugene Delano. No opposition to the present management was made. Several resolutions were offered to be submitted to the consideration of the board of directors.

Bituminous.

In the Atlantic seaboard soft coal trade there is little change since last week; it is dull, and orders are scarce with all producers. Most consumers are using their winter supply, and are content to reduce that to a minimum this mild weather before ordering a new lot. At this time of the year there is generally a dull spell from ice and weather causes, but the present dullness seems to come from stagnation. There are, of course, some few orders being received, which keep the mines running on short time. These come mostly from people who do not have to put in a winter supply, but who rely upon getting coal even in the most severe weather, and who generally lack storage room. There seem to be a few contracts in the market in the far East, which is very early in the season, but these may drag along for weeks before being placed. On regular business the far East is more than usually dull and the Sound demand seems to have fallen off to much under the normal, and what there is of it is somewhat erratic.

Some representatives of the soft coal trade appeared before the United States Senate committee last week in an effort to have them advance the tariff on coal from 40c., the present rate, to 75c. a ton. There are also various rumors of meetings of the trade that are to be held, but these seemingly have been adjourned to more advantageous times. There have likewise been reported meetings of the railroad presidents whose roads carry soft coal to the Eastern seaboard.

New York harbor trade is quiet, and all-rail business, although keeping up fairly well, is a little reduced. Transportation from mines to tidewater is excellent, as is the car supply.

In the coastwise vessel market vessels are still in short supply, but the demand for them is also slight.

We quote current rates of freight from Philadelphia as follows: To Boston and Salem, 80@85c.; Portland and Portsmouth, 85c.; Providence, New Bedford and other Sound ports, 70c. Five and ten cents above these rates are asked from Norfolk, Newport News and Baltimore.

The association prices remain as follows: F. o. b. Philadelphia, Norfolk and Newport News, $2.35; Baltimore, $2.28; New York Harbor shipping ports, $2.80 alongside; New York Harbor, $3. There is a 20c. differential in favor of Clearfield and Beech Creek coals.

Buffalo. Jan. 21.

(From Our Special Correspondent.)

The anthracite coal trade is moderately active as cold weather has accelerated consumption. No changes made in quotations.

Bituminous coal in fair demand only, as manufacturers are, as a rule, running moderately.

The firm of C. N. Shipman & Company, coal dealers, has dissolved and the goodwill and business of the late firm have been purchased and transferred to the Empire Coal Company, of which Mr. C. N. Shipman, of Buffalo, is President. Capt. James W.

Miller, of Detroit, was elected, last week, President of theLake Carriers' Convention.

At the annual meeting of the Lake Carriers' Association, held a few days since, the following paragraph appears in the report of the Board of Managers: "Your board also desires to call your attention to the fact that while the question of the price of fuel at Buffalo has not been as burning a problem in 1896 as it was in 1895, the saving of money to the members of the association did not stop when the agitation of this question stopped a year ago. The fight which was made in 1895 against overcharge for fuel in Buffalo has done its work during the season of 1896. In quality and price the fuel furnished steamers in Buffalo this season has been satisfactory, if the absence of complaints can be taken as evidence of that fact. We estimate that vessel owners have saved 40c. per ton on 200,000 tons of fuel taken on board at Buffalo, a total saving of $80,000."

Chicago. Jan. 20.

(From Our Special Correspondent.)

Anthracite.—Hard coal is hard to sell nowadays. Week in and week out for almost a couple of years dealers hereabouts have been forced to the above conclusion. The past week has proven no exception, the weather having been mild and the sales of coal represent an aggregate tonnage of hardly one-third of a fair week's total. Circular prices are unsteady. It is now a fact that coal can be had at retail at $6@$6.25 per ton, whereas a month ago $6.75 @$7 was asked. Circular prices we quote $5.60 egg, stove and chestnut $5.85.

Bituminous.—Coal sales so far this month are much behind the same period of 1896. Trade remains exceedingly slow, though the receipts of soft coal continue greatly beyond the demand. An investigation will be made next week in this city by soft coal dealers regarding the charge that the Baltimore & Ohio railroad has been cutting rates in carrying soft coal. The road has been making of late great efforts to get back its former extensive coal-carrying business, and it is presumed it has been making concessions in its attempt to do so. The rate war among Ohio soft coal-carrying roads is soon to be ended. A meeting of the seven roads comprising the Ohio Coal Traffic Association will decide it. An entire readjustment of rates will be made.

Pittsburg. Jan. 22.

(From Our Special Correspondent.)

Coal.—The river coal trade is in a very deplorable condition at present. There is absolutely no sale for coal down the river, and but few mines in the district are operated. The larger mines are closed, and it is impossible to tell when they will start again. The few mines that are being operated are being run to supply the small local demand. Of the 15,000 miners employed in the river district when the mines are in full operation, only about 2,000 are working at present. At New Orleans it is estimated there are not less than 500 loaded coal boats tied up, with no prospect of a sale; the same conditions exist at Cincinnati, Louisville and other points, the levees being overcrowded with coal boats. The worst part of the situation is that there are no indications of a brightening up.

Connellsville Coke.—The trade continues to improve; the gain in production was large, being over 100,000 tons for the first time since last July. The 281 ovens at Hazlett, the McClure's plant and the 100 ovens of the Anchor plant, formerly operated by the Atchison Coke Company, can no longer be considered as factors in the great industry of Fayette and Westmoreland counties and with their abandonment and the addition of the recently added new plants the ovens now operated in the Connellsville region number 17,990; of this number 9,817 are active and 8,173 are idle. The average working time last week was a little over five days; this will be increased this week. The shipments aggregated 5,809 cars. The machinery at the Mt. Braddock plant of W. J. Rainey has not all been set; the ovens are still being kept hot and will be charged to make coke as soon as repairs are done. Week's increase, 582 tons. The Dunbar furnace is undergoing repairs to be put in blast and fires will soon be lighted. The shipment of coke from this region amounted to 5,889 cars. To Pittsburg 2,469 cars; to points West, 2,615 cars; points East, 805 cars.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Jan. 22, 1897.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending Jan. 24, 1896.		Week ending Jan. 22, 1897.		From Jan., '96.	From Jan., '97.
	F'ces.	Tons.	F'ces.	Tons.	Tons.	Tons.
Anthracite.	59	38,630	20	19,150	130,389	60,186
Coke.....	162	184,150	117	136,600	631,367	429,314
Charcoal...	23	5,450	20	5,850	18,687	18,386
Totals....	244	227,630	157	161,600	780,443	507,886

While the iron market generally seems to be in a waiting condition, there are some indications of improvement. Perhaps the most marked is that the increasing production of pig iron is being absorbed and stocks at furnaces are not increasing. Prices continue to rule low, but there is an increased disposition on the part of consumers to take advantage of this fact and to put in stocks of raw material.

The most notable contract reported for the week has been that for the steel structural material for the new Southern Union Station in Boston. T is amounts to between 7,000 and 8,000 tons, and has gone to the Pennsylvania Steel Company.

Some reports have been current as to the Illinois Steel Company, but it is announced that the company has made arrangements to carry its floating debt, and is otherwise in a good financial condition.

NOTES OF THE WEEK.

The Tennessee Coal, Iron and Railway Company reports for the year 1896 net earnings amounting to $747,072; charges were $574,008, leaving a surplus of $172,464. As compared with 1895 there was a decrease of $261,039 in net earnings, and of $239,869 in surplus.

Articles of consolidation of the Butler & Pittsburg and the Pittsburg, Shenango & Lake Erie Railroad companies have been filed. The new corporation will be known as the Pittsburg, Bessemer & Lake Erie Railroad Company, with a capital stock of $10,000,000. The officers of the new company are: Samuel B. Dick, of Meadville, Pa., chairman of the board of directors; James H. Reed, Pittsburg, president; Jabez T. Odell, Pittsburg, vice-president; Thomas H. Given, Pittsburg, treasurer; A. Franks, Pittsburg, secretary. The directors include Andrew Carnegie, J. Edward Simmons, New York; Samuel B. Dick, A. C. Huidekoper, Meadville; Henry C. Frick, John G. A. Leishman, James H. Reed, J. T. Odell, Thomas H. Given, Andrew W. Mellon, Pittsburg; Edwin S. Mills, Cleveland; Thomas H. Wells, Youngstown. This is the new Carnegie road from Pittsburg to Lake Erie.

At the annual meeting this week of the stockholders of the Cambria Iron Company the following directors were elected to serve for the ensuing year: Josiah M. Bacon, Robert F. Kennedy, Charles S. Price, David Reeves, Powell Stackhouse, Edward T. Stotesbury, John W. Townsend, John Lowber Welsh and R. Francis Wood. The annual report showed that the company had earned about 9% on the capital stock of $8,000,000. A 4% dividend was paid, amounting to $320,000. This left $400,000, of which about $160,000 was expended for improvements in the manufacturing department. The balance of net earnings was carried to profit and loss, which increases this item to about $4,000,000, which is represented by bonds and stock assets in various collateral companies, most of which pay dividends.

New York. Jan. 22.

The market in this city shows little new this week. Several contracts are being considered, but these will not be placed for a short time yet. The Southern iron makers have received further orders from abroad, and we note one contract this week for 1,000 tons. A Manchester, England, concern is in the market for a quantity of Southern pig iron, and the order will probably be closed shortly. Stocks in dealers' hands are fair in volume, while those held by makers are large.

The New York, Susquehanna & Western Railroad Company is going to build an extension to its collieries about 10 miles in length. The chief engineer says they will need about 1,300 tons of 80-lb. rails for this work, and that bids will be received when the matter has been definitely decided, which will probably be next month.

A contract for 600 tons of material for a bridge at Newark, N. J., has been awarded to the Lukens Iron and Steel Company this week.

Contracts for two lighthouses have been recently placed here, one in this city and one to a firm in Bath, Me.

Pig Iron.—More business is being done in basic and Bessemer iron than in foundry, and several sales are heard of. In Southern irons we are aware of some shading in prices, and believe a difference of 25c. a ton on nominal quotations would not be refused.

For Northern iron we quote: No. 1 foundry, $12 @$13; No. 2 foundry, $12@$12.50; No. 2 plain, $11.25@ $11.50; gray forge, $10.50@$11. For Southern iron we quote: No. 1 foundry, $11.50@$12; No. 2 foundry, $11@$11.25; No. 3 foundry, $10.50@$10.75; No. 1 soft, $11@$11.50; No. 2 soft, $10.50@$11; forge, $10 25@ $11; basic pig, $11.50@$11.75. All prices are for tidewater delivery. We are informed that sales have been made at Alabama furnace as follows: No. 1 foundry, $8@$8.25; No. 2 foundry, $7.25@$7.50; No. 1 soft, $7.75@$8; No. 2 soft, $7.25@$7.50.

Cast-Iron Pipe.—The larger manufacturers are cutting prices wherever they can secure an order to fill up until spring, when prices will probably be advanced. The smaller concerns cannot quote remunerative figures at this time and must wait. We note a contract taken this week amounting to 15,000 tons. A few small contracts have been taken at low prices.

Spiegeleisen and Ferro-Manganese.—Hardly anything has been done in either of these. Ferromanganese is quoted at $48 for imported 80%, New York. For 20% spiegeleisen $19@$19.50 per ton is quoted.

Steel Billets and Rods.—No change in prices and some sales of billets are reported on the basis of $15 @$15.50 per ton at Pittsburg.

Merchant Iron and Steel.—Business continues quiet with chiefly small sales. Prices show no change. For bars we quote: Common, 1·10@1·15c.; refined, 1·20@1·50c.; soft steel bars, 1·20@1·30c. Other quotations are: Steel hoops, 1·50@1·60c.; steel axles, 1·60@1·75c.; links and pins, 1·60@1·70c.; tire steel, 1·80@1·90c.; spring steel, 1·95@2·15c. All prices are for delivery on dock New York.

Plates.—Several sales are noted this week, though small in volume. Somewhat higher prices are asked. We quote for universal mill plates, 1·20 @1·30c. For steel plates prices are: Tank, 1·30@ 1·35c.; boiler shell, 1·40@1·45c.; flange, 1·45@1·55c.; firebox, 1·70@1·75c., according to quality. Charcoal iron plates are 2·25 for shell, 2·75 for best flange and 3·25 for firebox. Rivets are 3@3·25c. for iron and 2·15@2·25c. for steel. Prices are for tidewater delivery.

Structural Iron and Steel.—Business has been on a small level, but we quote for angles, 1·20@1·30c.; tees, 1·55@1·65c.; channels, 1·70@1·80c. The price of beams, New York delivery, is 1·70c. for ordinary sizes, 1·85c. for 20-in., and 1·95c. for 24-in., large lots. Smaller orders are 0·10@0·25c. higher.

Steel Rails and Rail Fastenings.—The price for standard sections is $25 per ton at mill, or $26 tidewater. Girder rails are $25@$27 per ton at mill, according to section.

For rail fastenings demand is light, and will probably continue so until railroad work begins in the spring. Prices are, for angle bars, 1·15@1·25c.; spikes, 1·60@1·65c., bolts, 1·85@1·90c. for square nuts and 1·90@2c. for hexagon nuts.

Wrought-Iron Pipe.—Business continues quiet. Discounts are as follows for plain pipe, out of store: 1½ in. and over, 67, 10, 10, 10, 10 and 10%; 1¼ in. and under, 57, 10, 10, 10, 10 and 10%. Galvanized pipe, 1½ in. and over, 55, 10, 10, 10, 10 and 10%; 1¼ in. and under, 50, 10, 10, 10, 10 and 10%. Boiler tubes, 1 in. to 2¼ in., 70, 10 and 5%; 2½ in. up, 75 and 5%. Cold-drawn seamless steel tubes, 60%.

Nails.—Sales are only moderate. For steel wire nails we quote $1.45 Pittsburg, or $1.70 New York, for large lots. Cut nails are about $1.30 Pittsburg, or $1.55 New York.

Old Rails.—Old iron rails are quoted $12.50@$13.-50, New York, with no sales. Old steel rails are quoted $10.50@$11.50. Old steel rails fit to relay, standard sections, can be had at $19@$22, New York harbor delivery, according to condition. Old wrought-iron pipe is quoted $7.50@$8 per ton.

Scrap Iron.—A few sales are noted and we continue to quote for good machinery scrap $10@$12 per ton; ordinary cast scrap, $8@$9.50; stove-plate and mixed, $6.50@$8. Old car wheels are $11@$11.50 per ton, New York delivery. There is some demand for heavy steel scrap for export.

Buffalo. Jan. 20.

(Special Report of Rogers, Brown & Co.)

The improvement in the consumption and demand of pig iron is slowly developing. From a period of absolute stagnation we appear to be emerging into a period of inquiry for large lots and more frequent inquiry for smaller purchases. Very few of these have ripened into actual transactions, but they are clearly the first steps and the natural beginnings of better trade. Meanwhile the accumulated stocks have been growing heavy on the hands of producers, occasioning a keen anxiety to sell and to take such business as is offering. Our quotations below are on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, $12; No. 2 strong foundry coke iron, Lake Superior ore, $11.50; Ohio strong softener No. 1, $12.25; Ohio strong softener, No. 2, $11.75; Jackson County silvery No. 1, $14.25; Southern soft No. 1, $12; Southern soft No. 2, $11.50; Lake Superior charcoal, $14.

Chicago. Jan. 20.

(From Our Special Correspondent.)

Pig Iron.—The condition of the pig iron business at this point remains unchanged. Carloads up to 100-ton lots constitute the transactions. Enquiries do not bespeak any better trade and the lack of improvement furnishes much food for gossip. The many industries contiguous to this territory and those within the city using pig iron, are putting off buying until the very latest moment, presumably from the fact that they are awaiting a greater business and do not care to stock up until there is some evidence that the situation has improved. Prices on pig iron hold very well despite poor trade. We quote: Lake Superior charcoal, $13.50@$14; local coke foundry No. 1, $11.75@$12.25; No. 2, $11.25@ $11.75; No. 3, $11@$11.25; local Scotch foundry No. 1, $11.75@$12.25; No. 2, 11.25@$11.75; Southern coke No. 1, $11 65@$11.90; No. 2, $11.15@$11.40; No. 3, $10.90@$11.40; Southern No. 1 soft, $11.40@$11.65; No. 2 soft, $10.90@$11.40; Southern silveries No. 1, $12.15@$12.65; No. 2, $11.65@$12.15; Jackson County silveries, $14@$16.05; Ohio silveries No. 1, $15@ $15.55; Ohio silveries No. 2, $14.50@$15.05; Ohio strong softeners, $14@$14.28; Alabama car wheel, $16.65@$17.15; coke Bessemer, $13@$13.50.

Bar Iron.—Bar iron sales continue limited and those going are in small lots. Inquiry remains poor. Common iron is quoted 1·25@1·30c. and refined bars, 1·35@1·40c.

Steel Rails.—The main feature of the week is the closing down of the rail and converting departments of the Illinois Steel Company at South Chicago; 1,200 men are thrown out of work. Poor business is the cause of the shut-down. Rail busi-

ness continues exceedingly slow. Rails are quoted $26 per ton, Chicago.

Steel Billets.—No business worth mentioning has appeared. Inquiry is poor and prospects bad for early betterment. Quotations are dropped for the time being.

Structural Material.—Business in structural shapes is slow. A few small bridges are on the market. The elevated loop is now being erected in Van Buren street, iron having been received from the mill during the past week. The Alley Elevated, it is said, will make connection with the loop. Quotations are: Plates, 1·30@1·35c.; beams and channels, 1·70@1·80c.; angles, 1·30@1·35c.; tees, 1·50 @1·55c.

Cleveland. Jan. 20.

(From Our Special Correspondent.)

Iron Ore.—The iron ore market has been inactive during the past 10 days. The brokers report that they have done almost nothing. The prevailing prices for the coming season have not been discussed, but it is believed that the Western Iron Ore Association will hold a meeting soon and arrange prices that will govern during the year. Until that is done not many sales of ore will be made, because buyers and sellers alike want any advantage that may result from the session of the Ore Association. Quite a quantity of ore has been shipped to the furnaces, but that has no bearing on the market, as the sales were made some time ago.

The brokers are of the opinion that lake freight rates will be much lower this season than last. Already they have begun to talk of an 80c. rate from the head of the lakes. The ore quotations follow: Standard hard speculars, Bessemer quality, $4.50@$5; standard hematites, Bessemer quality, $4@$4.25; standard hard hematites, non-Bessemer quality, $3.50@$4; standard soft hematites, non-Bessemer quality, $2.50@$3.25.

Pig Iron.—The only indications of activity in the market during the past week have been in the foundry varieties. Taken as a whole, the market has been very quiet. Prices are now said to be so low that buyers will find it extremely difficult to press them down much lower, as the sellers would gain nothing by making transactions at such figures. There has been no change in the quotations which follow: Lake Superior charcoal, $13.50; Bessemer, $11@$11.25; No. 1 foundry, $11.75; No. 2, $11.40; No. 1 Ohio Scotch, $12; No. 2, $11.50; Mahoning and Shenango Valley neutral mill irons, $10; Mahoning and Shenango Valley red short mills, $10.

Philadelphia. Jan. 22.

Pig Iron.—More iron has been selling this week, and inquiries show that both large and small buyers are preparing to purchase more freely. This they will probably do unless some disturbing influence suddenly arises. Prices in all ordinary transactions are the same as a week ago. No. 1 foundry is selling at about $13 delivered, though cases come to light where a good brand sold at less; No. 2 X is $12 for a good iron, and plain $11.50. Bessemer will command $12.50, basic $11.50, and low phosphorus $16.50. Several consumers of Bessemer are looking around, but are asking for better terms and prices than have been offered.

Steel Billets.—Billets are weakening, but as big orders are very rare and small ones not plenty, by any means, it is impossible to give bottom prices. It is said that $17 will soon be the price.

Merchant Iron.—There is no change in prices and business is slow. Present quotations are made to tempt business. Large lots, 1·10@1·15c.; refined, 1·20c.; steel, 1·20c. for small lots.

Sheets.—The sheet iron workers are gathering in more business and everything looks brighter.

Pipes and Tubes.—Business is dull. No reports.

Merchant Steel.—Store distribution up to to-day has been light. The reports from mills are that more orders are being booked, but they are not going from here. There is a good deal of canvassing going on for business.

Plate and Tank.—Small orders have picked up much. The larger consumers are said to be about ready to place large orders. The outlook is much better. Tank is 1·25; universals, 1·30; shell, 1·35; flanges, 1·50, and firebox, 1·70@2·00c.

Structural Material.—A Boston and a local job were placed this week. Plenty of work is in sight, the brokers say. The large 10,000-ton order of bridge iron is virtually placed now. Angles are 1·25c.; beams, 1·70c. upward. The coming week will open up a good deal of work.

Steel Rails.—No report.

Old Rails.—A little business was done at $14.

Scrap.—The week has been unusually dull.

Pittsburg. Jan. 21.

(From Our Special Correspondent.)

Raw Iron and Steel.—The iron market, in many respects, is still a waiting one; but taken as a whole the volume of business shows up well. Many dealers are disappointed from the fact they expect too much. The market for iron and steel products has shown scarcely any change since the close of last week; there is considerable inquiry for Bessemer pig; prices, however, are unsettled and irregular. The rumors going the rounds of very low prices are not worthy of notice; parties who have refused to make concessions so long are disposed to hold out to the end. They are well aware that the time for better prices is near at hand, and there is not the apathy on the part of consumers which was so noticeable a short time since. Indications are present of a disposition to consider purchases. It is true that many of the heaviest consumers are holding off in the matter of buying, feeling that further concessions in prices may yet be obtained, but with the advance of the season a quickening of demand must come, and with it better prices. Additional works have gone into operation each week in January, and the working force is larger than at any time in six months; best of all there is so little excitement that the gain may be ascribed to the deliberate judgment of the most prudent men in business. It seems impossible to learn to what extent the increased output is being piled up on the furnace banks, but there is plenty of evidence that consumption has increased during the past three months and is probably equal to the production. In the local pig iron market there is a little more activity, but the increase in business is at the expense of values.

The steel rail trade is disappointing; trunk line railroads are not placing orders to the extent it has been expected that they would by this time and orders from other sources are moderate. An item of interest in connection with steel was the shipment of 1,000 tons of billets to Birmingham, England, on the steamer *Harrow*, which cleared from Philadelphia on Thursday.

Latest.—Business, so far as it relates to transactions, was good with a liberal volume of sales; prices are weak, with a downward tendency. Bessemer sales were made at $10.40 Pittsburg, the lowest point yet. Mill iron sold at $9.50@$9.75. Steel billet sales were made at various prices, $15.75@$16. The general feeling seems to be that the bottom has been reached and that the next movement will be an upward one.

COKE, SMELTED, LAKE AND NATIVE ORE.

Tons.		Cash.
10,000	Bessemer, next 4 mos., Pitts...	$10.65
6,000	Bessemer, Jan., Feb., Mar., Pitts.....	10.60
5,000	Bessemer, prompt, Val...	10.00
5,000	Bessemer, Jan., Feb., Mar., Pitts	10 40
4,000	Bessemer, Jan., Feb., Mar., Val.	10.15
3,000	Bessemer, Jan., Mar., Pitts....	10.50
2,500	Bessemer, Jan., Feb., Pitts....	10.40
2,000	Bessemer, Feb., Val	10.00
1,300	Mill Iron, prompt, Val...	8.90
1,000	Bessemer, Feb., Pitts.....	10.90
1,000	Bessemer, Jan. Feb., Pitts.....	10.75
1,000	Mill Iron, Feb., Pitts.....	9.50
1,000	Bessemer, Jan., Pitts.....	10.65
500	Mill Iron, Jan., Pitts	9.60
500	Mill Iron, Jan., Pitts	9.75
100	No. 2 Foundry, Pitts	11.50
75	No. 2 Foundry, Pitts	12.00

CHARCOAL.

65	Cold Blast, Pitts	$23.60
50	No. 3 Foundry, Pitts.....	15.80
50	No. 2 Foundry, Pitts	15 80
25	Charcoal, Pitts.	23.25

BLOOMS, BILLETS AND SLABS.

1,200	Billets, Jan., Feb., Pitts.....	15.90
500	Billets, Jan., Pitts.....	16.00
500	Billets, Jan., Pitts.....	15.85
300	Billets, Jan., Pitts.....	15.75
300	Billets, Jan., Pitts..	16.00

MUCK BAR.

500	Neutral, delivered, Pitts.....$19.50	

BLOOMS, BILLETS, SLABS.

500	Billet ends, Pitts.	$12.00

SHEET BARS.

1,000	Delivered, Pitts..	$17.50

STEEL WIRE RODS.

2,000	5 guage, at mill, Pitts.....	$20.00

FERRO-MANGANESE.

500	80 per cent., delivered, Pitts.	$47.00
100	80 per cent., Pitts.....	47.50

SCRAP AND OLD RAILS.

300	Steel rails, grass, Pitts...$11.00	
200	No. 1, wrot, net, Pitts	12.00
100	Cast scrap, net, Pitts.....	11.50
100	Cast boringe, gross, Pitts,...	6.75
50	Old car wheels, net, Pitts	10.25

SKELP IRON.

600	Narrow grooved, Pitts.....$1.20 4 m.	
500	Wide grooved, Pitts,...	1.20 4 m.
300	Sheared, Pitts.	1.35 4 m.

SKELP STEEL

600	Wide grooved, Pitts.....$1.00 4 m.	
300	Sheared, Pitts.....	1.20 4 m.
250	Narrow grooved, Pitts.	1.00 4 m.

Cartagena, Spain. Jan. 4.

(Special Report of Barrington & Holt.)

Iron and Manganiferous Ores.—Tonnage is not as free as expected, but Mediterranean ore freights are 1s. to 1s. 3d. per ton lower than they were a month ago. Shipments have consequently been more lively, and 12 cargoes of manganiferous ore with two of dry ore were dispatched from Cartagena during December. There was also shipped for France a cargo of 60% magnetic ore from the new mines in the district of Cehigin in the Province of Murcia. This is the first cargo from these mines, which are at present producing about 100 tons a day, but as soon as they are fully opened up it is expected that they will produce a much larger quantity and of a quality carrying about 64% iron.

We quote for ordinary 50% Portman ore, 5s. 8d.@6s. 2d. per ton; special low phosphorus, 5s. 4d.@6s. 8d.; special iron ore, 7s. 2d.; specular iron ore, 60% iron and guaranteed under 0.03 phosphorus, 7s. 3d. For manganese ore we quote: No. 1, 20% iron and 20% manganese, 15s. 8d.; No. 2, 30% iron and 15% manganese, 11s. 4d., No. 3, 35% iron and 13% manganese, 9s. 8d. per ton.

Shipments of ocher in December were 380 tons, all to the United Kingdom.

METAL MARKET.

NEW YORK, Friday Evening, January 22, 1897.

Gold and Silver.

Prices of Silver per Ounce Troy.

January.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in $1.	January.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in $1.
16	4.87⅛	29 11/16	61¾	.501	20	4.87⅛	29 11/16	61¾	.501
18	4.87⅛	29 11/16	61¾	.501	21	4.87⅛	29 11/16	61¾	.501
19	4.87⅛	29 11/16	61¾	.501	22	4.87⅛	29¾	61¾	501

Owing to the appearance in the market of Continental orders, silver has become firmer and all visible supplies at 29¾d. have been secured. The market closes firm at this figure. It is reported that Spain has been a buyer.

The United States Assay Office in New York reports the total receipts of silver at 99,000 oz. for the week.

Gold and Silver Exports and Imports

At all United States ports, December, 1896, and years from January 1st, 1896 and 1895:

	Doin and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD.					
Dec..	$405,856	$2,572,271	$25,970	$227,076	I. $2,367,521
1896..	56,742,844	102,766,438	209,621	1,963,124	I. 47,777,097
1895..	104,695,023	32,538,736	362,379	1,857,656	E. 70,571,016
SILV.					
Dec .	6,819,145	1,279 801	101,285	1,661,009	E. 3,980,020
1896..	63,029,336	12,504,577	993 405	17 739,280	E. 33,777,884
1895..	53,833,153	11,285,007	377,933	13,087,340	E. 29,837,739

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

Average Monthly Prices of Silver

In New York and London, per ounce Troy, from January 1st, 1896, and for the years 1895 and 1894.

Month.	1896.		1895.		1894.	
	London. Pence.	New York. Cents.	London. Pence.	New York. Cents.	London. Pence.	New York. Cents.
January .	30·69	67·13	27·36	59·69	30·81	66·63
February..	31·01	67·67	27·47	59·90	29·18	63 43
March	31·34	68·40	28·33	61·98	27·28	59·49
April.....	31·10	67·92	30·39	66·61	28·95	62 92
May.....	31·08	67·88	30·61	66·75	28·69	62·96
June	31·16	68·69	30·47	66·64	28·68	62·59
July..	31·45	68·75	30·48	66·75	29·82	62·45
August....	30·93	67·34	30·40	66 61	28·29	61·83
September	30·19	65 68	30·54	66·90	38·88	64 14
October...	29 68	65·05	30·89	67·64	28·69	63·06
November	29 46	64 98	30·79	67·46	39 41	65·13
December.	29·70	65·24	30·49	66 47	27·78	60 43
Year.....	30·07	67·06	29·53	65·28	29·13	63·00

The New York prices are always per fine ounce, or ounce of pure silver; the London quotation is per standard ounce, or for metal 925 fine.

Gold and Silver Exports and Imports, New York

For the week ending January 22d, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	$21,400	$10,113	$664,830	$32,871	E. $643,243
1897..	1·8,900	153,851	2,081,575	104,678	E. 1,931.946
1896..	8,318,023	5,143,087	2,761,810	130,014	E. 5,74,6762
1895..	18,261,676	3 4.635	2,403.257	105,315	E. 20,2·4.953
1894 .	939 296	261,828	3,412,790	113,782	E. 3,976,476

The gold exported for the week went to the West Indies; the silver went to London, Paris and South America. The gold and silver imported came principally from Central and South America.

FINANCIAL NOTES OF THE WEEK.

Business revives but slowly, and there seems to be little hope of a marked improvement in the situation until Congress adjourns. The possibility of a new outbreak at any time on the Cuban question and other uncertainties incline men to be rather conservative in their arrangements for the future. There are some elements of strength, however, and the volume of business, as shown by the clearing house and other returns, continues to gain.

There seems to be no probability of gold exports for some time to come. The continued heavy exports and light purchases abroad have more than balanced all the requirements for January interest, etc., and London continues to be a debtor to New York. At the same time the evident determination of the political managers to make the tariff the leading issue and to set aside currency reform, has discouraged foreign buying of our securities, and not much money is likely to come here on that account.

Money continues to accumulate in New York, and the loan market is overstocked in a rather discouraging way, since it shows that the demand for business purposes is not what it ought to be. The London market is easier, and on Thursday the Bank of England reduced its discount rate from 4% to 3½%. Another drop is thought to be probable next week.

Exports of specie from San Francisco by water for the 12 months ending December 31st were as follows:

	1895.	1896.
Silver bars	$8,087,546	$5,788,903
Mexican dollars	10,645,524	8,197,756
Peru sols	27,698	161,357
U. S. coin	295,091	692,525
Total silver	$18,455,859	$14,840,541
Gold bars and dust	7,447	46,718
Gold coin	6,323,472	11,742,795
Total gold	$6,330,919	$11,789,513
Total	$24,786,778	$26,630,054

The shipments in 1896 went to the following points: China, $7,167,527; Japan, $4,848,305; India, 885,000; Honolulu, $1,012,190; Mexico and Central America, $165,356; New York, $11,250,856. The increase in 1896 was entirely in gold coin shipped to New York.

The statement of the United States Treasury on Thursday, January 21st, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	Jan. 14.	Jan. 21.	Changes.
Gold	$140,097,749	$142,811,118	I. $2,713,369
Silver	18,606,397	17,610,724	D. 995,673
Legal tenders	23,322,682	16,865,812	D. 6,456,870
Treasury notes, etc.	34,9:7,947	35,347,224	I. 419 277
Totals	$216,954,775	$212,634,878	D. $4,319,897

Treasury deposits with national banks amounted to $16,505,100, an increase of $204,867 during the week.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, $118,841,280. Against these are held in the Treasury 9,649,164 coined standard silver dollars and silver bullion purchased at a cost of $109,192,116, making a total of $118,841,280.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending January 16th, gives the following totals, comparisons being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts	$490,322,900	$453,958,200	$491,399,200
Deposits	562,302,900	492,403,800	557,386,300
Circulation	11,412,100	13,923 400	18,743,000
Reserve:			
Specie	77,955,300	73,610 500	77,821,300
Legal tenders	108,085,500	81,836,000	113,697,800
Total reserve	$186,040.800	$155,446,500	$191,519,100
Legal requirement	140,575,725	123,100,950	139,344.575
Surplus reserve	$45,465,075	$32,345.550	$52,174,525

Changes for the week this year were increases of $283,000 in loans and discounts, $9,348,100 in deposits, $928,300 in specie, $9,589,800 in legal tenders and $8,801.075 in surplus reserve; decreases of $163,900 in circulation.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars and comparison is made with the holdings at the corresponding dates last year:

	Gold.	Silver.	Total.
Asso. Banks of New York			$77,821,300
1896			73.610.500
Bank of England	$177,007,490		177,007,490
1896	238,481,905		238,481,905
Bank of France	381,484,800	$245,688.300	627,173,100
1896	387,438,867	247,409,425	634,848,292
Imp. Bank of Germany			214,150,000
1896			224 510 000
Austro-Hungarian Bank	151,660,000	63,068,000	214,728,000
1896	122,350,000	63,541,000	185,891,000
Netherlands Bank	13,171,000	34,113,000	47,284,000
1896	15,947,000	34,221,000	50,168,000
Belgian National Bank			20,572,000
1896			20,533,000
Bank of Spain	42,642,000	51,137,000	93,779,000
1896	40,022,000	50,056,000	90,078,000
Bank of Italy	59.780,000	11,985,000	71,765,000
1895	59,860,000	9,950,000	69,810,000
Imp. Bank of Russia	518,355,000		518,355,000
1895	395,035,000		395,635,000

The return for the Associated Banks of New York is of date January 16th; all the others are of January 21st, except the Bank of Italy, December 10th, and the Bank of Russia, December 16th–28th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Indian exchange continues in fair demand, and the 40 lakhs of Council bills offered in London were all taken at an average of 15·34d. per rupee, which is very little below that of the past six weeks. The India Council, to provide the funds necessary for famine expenditures and extraordinary works, has sold £1,000,000 in one year gold treasury bills in London. These bills were taken at an average of 97·7%; that is, the Council will pay 2·3% interest for the year which the bills have to run. The applications largely exceeded the amount, so that the Council was able to select the best bids.

The report of the British Mint shows that the coinage executed during the year 1896 was as follows, the number of pieces struck being given:

	Imperial.	Colonial.	Totals.
Gold	6,280,670	.....	6.280,670
Silver	25,970,839	23.650,540	49 621,379
Bronze	36 958,266	2 977,500	39 935,766
Totals	69 209,775	26,628,040	95,837,815

The face or coinage value of these coins was: Gold, £4,981,800; silver, £681,496; bronze, £111,766. During the year light gold coins of the face value of £2,380,000 were retired. The number of pieces coined in 1896 shows an increase of 23,228,109 over that reported in 1895.

Prices of Foreign Coins.

The following are the latest market quotations for the leading foreign coins:

	Bid.	Asked.
Mexican dollars	$0.50¾	$0.51⅛
Peruvian sols and Chilean pesos	.45¾	47
Victoria sovereigns	4.85	4.90
Twenty francs	3.85	3.90
Twenty marks	4.73	4.80
Spanish 25 pesetas	4.78	4.85

Shipments of silver from London to the East for the year up to January 7th are reported by Messrs. Pixley & Abell's circular as below:

	1896.	1897.	Changes.
India	£81,900	£95,200	£13,300
China	.....	.....	.....
The Straits	13,800	2,600	D. 11,200
Totals	£95,700	£97,800	D. £2,100

Arrivals for the week this year were £151,000 in bar silver from New York, £2,000 from the River Platte and £9,000 from the West Indies, also £11,000 in Mexican dollars from the West Indies, a total of £173,000. Shipments for the week were £95,200 in bar silver to India, and £2,600 in Mexican dollars to Penang; a total of £97,800.

Other Metals.

Copper.—The market continues very firm and higher prices have again been established. Early in the week lake copper changed hands at 11⅞c., but later on 11⅛@12c. was quoted, with sellers at the latter price. For electrolytic copper rather lower prices were accepted, values ranging from 11·30@11·40c. for cakes, wirebars or ingots and 11·05@11·15c. for cathodes. Casting copper is very scarce, and full prices have been realized for it, 11¼@11⅜c., according to brand and quantity. Large transactions took place from day to day, and it is now understood that some sales have also been made for export.

In the foreign market values also appear to be rather irregular. The speculative brands have materially advanced, and g. m. b.'s are now quoted £50 15s.@£50 17s. 6d. for spot and £51 5s.@£51 7s. 6d. for three months prompt, which prices are higher than at any time during 1896. On the other hand, consumers' copper did not follow the advance in the same ratio, and it is claimed that a great many lots are still offered by second hands rather below first hands. The firm tendency, however, continues and some interest is shown. For refined and manufactured we quote: English tough, £52 10s. @£52 15s.; best selected, £53@£53 10s.; strong sheets, £60 10s.@£61; India sheets, £57@£58; yellow metal, 5⅛d. The statistics for the first half of the month were rather favorable, the visible supplies having decreased 1,500 tons.

Average Monthly Prices of Lake Copper

In New York, for the years 1896, 1895, 1894, 1893 and 1892; in cents per pound.

Month.	1896.	1895.	1894	1893.	1892.
Copper (Lake):					
January	9·87	10·00	10·13	12·13	11·00
February	10·64	10·00	9·63	12·00	10·00
March	11 03	9·75	9·81	11·88	10·38
April	10·98	9·75	9·50	11·38	11·50
May	11·15	10·25	9·80	11·00	11·63
June	11·67	10·63	8·91	11·00	11·86
July	11·40	11·25	9·00	10·88	11·50
August	10 98	12·00	9·13	10·00	11·50
September	10·66	12·25	9·40	9·88	11·13
October	10·65	12·00	9·88	9·75	11·50
November	11·23	11·00	9·60	10·00	11 88
December	11·28	10·50	9·80	10·25	12 38
Year	10·88	10·76	9·56	10·75	11·55

Lead has been rather dull and quiet, but prices are firmly held at 3·05@3·07½c. delivered New York, and 2·77½@2·80c. St. Louis. Most of the consumers appear to be well provided with nearby delivery lead, while producers do not care to offer late delivery.

In London the market has been very firm, and prices for Spanish have advanced to £11 15s.@£11 16s. 3d., and English lead 5s. more, but the market closes rather dull and inactive at these figures.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Market is very quiet. Chemical and soft Missouri lead is nominally 2·77½c. and 2·80c., respectively. Desilverized refined lead is nominally 2·82½@2·85c.

Spanish Lead Market.—Messrs. Barrington & Holt write from Cartagena, Spain, under date of January 4th as follows: Local quotations for pig lead on wharf remain high, owing chiefly to the exchanges. For December, the average 61·60 reales per quintal of lead, against 61·43 reales in November, silver being paid at the rate of 15 reales per ounce. The average price of lead per quintal on wharf during 1896 was 57·77 reales, against 49·45 reales in 1895. The average price of silver was 14·94 reales per ounce, against 13·94 reales in 1895. Exports of pig lead from this port in December were: Marseilles, 2,125,762 kg.; Genoa, 150,000 kg.; Antwerp, 908,823 kg.; United Kingdom, 4,016,917 kg.; total, 7,201,493 kg. In addition to these shipments of lead, we note exports of 127 tons of galena, and 2,680 tons blende ores. We quote for lead ores: Potter's ore, 8s. 9d. per cwt.: Linares sulphide ores, 78%, 6s. 8d.; Linares carbonate, 59%; 4s. 4d. per cwt.

Average Monthly Prices of Lead

In New York, for the years 1896, 1895, 1894, 1893, 1892; in cents per pound.

Month.	1896.	1895.	1894.	1893.	1892.
Lead:					
January	3·08	3.10	3.19	3·87	4·20
February	3·19	3 12	3·31	4·22	4·12
March	3·14	3·12	3·37	3·96	4·21
April	3·07	3·08	3·43	4·08	4·15
May	3·03	3·16	3·39	3·89	4·22
June	3·03	3·25	2·31	3·77	4·16
July	2·96	3·20	3 50	3·88	4·13
August	2·73	3·50	3·41	3.41	4·11
September	2·77	3·35	3·17	3 89	4·11
October	2·80	3·33	3·12	3 51	4·02
November	2 96	3·25	3·14	3·41	3·84
December	3·04	3·22	3·10	3.27	3·80
Year	2·98	3·23	3·29	3·73	4·09

Tin.—Advices from abroad have been of a rather encouraging nature, and it is evidently believed there that better prices are ahead of us, especially as production appears to have been falling off for the last few months. The higher prices asked have, however, considerably checked business here and transactions are much smaller than of late. As stocks are small and consumers have but limited quantities ahead the tendency of our market will have to be guided by that established abroad. We quote January 13·70c. and February to June 13·80c.

In London the market opened rather higher at £60 7s.6d.@£60 10s. for spot and 15s. higher for three months prompt, hardening from day to day, with only slight reactions, and closing at about the best, viz.: £61 2s. 6d.@£61 5s. for spot and £61 17s. 6d.@£62 for three months prompt. It looks as though tin were attracting more attention from speculators, and this will have some influence on the price.

Average Monthly Prices of Tin

In New York, for the years 1896, 1895, 1894, 1893, 1892; in cents per pound:

Month.	1896.	1895.	1894.	1893.	1892.
Tin:					
January	13·02	13·25	20·16	19 99	20·50
February	13·44	13·35	19·60	20 30	20·00
March	13·30	13·20	19·09	20·71	20·25
April	13·34	14·00	19·75	20 81	20·50
May	13·54	14·65	20·21	19 96	20·80
June	13·59	14·15	19 75	19·76	22·00
July	13·63	14·40	19·22	19·15	21·00
August	13·19	14·35	19.22	18 81	20·50
September	13·15	14·45	16·27	20 14	20·35
October	12·94	14·65	15·35	20 84	20·50
November	13·09	14·40	14·56	20·61	20·80
December	12·96	13·91	13 81	20·67	20·00
Year	13·29	14 05	18·08	20·15	20·60

Spelter.—In the beginning of the week the market was flat, but later on much better buying set in and prices have steadied. We have to quote for prime Western spelter 3 90@3 95c. New York and 3·67½@3·70c. St. Louis. The market continues to be rather unsettled, and buyers are acting with great caution.

In London good ordinaries have advanced to £17 16s. 3d. and specials to £17 18s. 9d.

Average Monthly Prices of Spelter

In New York, for the years 1896, 1895, 1894, 1893, 1892; in cents per pound:

Month.	1896.	1895.	1894.	1893.	1892.
Spelter:					
January	3·75	3·28	3 56	4·39	4·69
February	4·03	3·20	3 85	4·39	4·69
March	4·20	3·23	3·89	4·28	4·89
April	4·09	3·30	3·62	4·38	4 68
May	3·98	3·50	3·47	4·41	4·79
June	4·10	3 65	3·40	4·27	4·71
July	3·97	3 75	3 43	4·13	4·78
August	3·76	4·15	3·38	3·89	4·69
September	3·60	4·30	3·44	3 69	4·53
October	3 72	4·10	3·45	3·68	4·41
November	3·99	3·55	3·36	3·65	4·47
December	4·14	3 49	3·43	3·80	4·40
Year	3 94	3·53	3·52	4·08	4·63

Antimony is flat; Cookson's is quoted at 7¼c., U. S. Star 7c. and Hallett's 6¾c.

Aluminum.—While no change in prices of ingots and bars has been made, the Pittsburg Reduction

Company announces a decrease in prices of sheets. The quotation for ⅜-in. rolled sheets is dropped from 56c. to 46c. per lb., and similar reductions are made all through the list. Rolled sheets from ⅜ in. to No. 20, B. & S. gauge, can be obtained up to 60 in. wide.

Nickel.—Sales have been light, but prices are unchanged. We quote for ton lots 33@36c. per lb., with 37@39c. for smaller orders. London prices are steady at 14@15d. for large orders and 15@16½d. for small lots. The New York price is about on a parity with London, allowance being made for the duty of 6c. per lb. here. The Paris quotation is 4 fr. per kilo, equivalent to about 36c. per lb.

Platinum.—Demand is steady and prices are firm at $14.50@$15.50 per oz., New York. London quotations are 57s. 6d.@59s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotations, the prices given being respectively for orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 50c., 51c. and 52c. per gram. Wire and foil are 47c., 48c. and 49c. per gram. The current retail price for crucibles is 60c. per gram.

Quicksilver.—The New York quotation is unchanged at $36.75 per flask. The London price is £6 12s. 6d. per flask, with £6 11s. 3d. named from second hands. Quicksilver receipts at San Francisco in December were 1,564 flasks. For the year ending December 31st, they were 28,729 flasks. Exports by water for the year were: China, 3,000 flasks; New Zealand, 20; Mexico, 5,258; Central America, 1,347; British Columbia, 19; New York, 2,500; total, 12,144 flasks. Shipments overland by rail for 11 months (December not yet reported) were 14,841 flasks.

The Minor Metals.—Quotations for these metals are given in the table below, the prices being for New York delivery:

Aluminum:	
No. 1, 98% pure ingots for re-melting, per lb	37@42c.
No. 2, 94% pure, " " "	31@34c.
Ingots from scrap, per lb	30c.
Aluminum-nickel casting metal, per lb	25@40c.
Bismuth, per lb	$1.45@$1.90
Phosphorus, per lb	5 @55c.
Platinum, per oz	$14.50@$15 50
Tungsten, pure powder, per lb	70c.
Tungstic acid, per lb	45c.
Ferro-tungsten, 60% in ton lots, per lb	60c.

Variations in prices are chiefly on size of order.

Imports and Exports of Metals.

New York.*	Week, Jan. 21.		Year, 1897.	
	Expts.	Impts.	Expts.	Impts.
Aluminum ..... lbs.	.....	.....	.....	.....
Antimony ore....short tons	.....	39	.....	43
" regulus.. casks	.....	65	.....	95
Brass, old.....short tons.	2	.....	7	.....
Copper, fine .....long tons	985	40	4,082	177
" matte ... " "	577	.....	976	.....
" ore..... " "	.....	.....	.....	.....
" sulphate.. " "	.....	.....	133	.....
Iron ore..... " "	.....	.....	.....	.....
" pigs, bars, rods..... " "	29	.....	46	156
Iron pyrites..... " "	.....	.....	.....	2,670
" sulphate ..... " "	.....	.....	.....	.....
Ferro-mangan'se " "	18	.....	85	52
Ferro-silicon..... " "	.....	.....	.....	.....
Manganese ore.. " "	.....	60	.....	60
Spiegeleisen..... " "	.....	.....	.....	30
Lead bullion..... " "	22	1,086	1,497	2,441
" pigs and bars " "	.....	.....	.....	.....
Magnolia metal... " "	.....	.....	57	.....
Nickel..... " "	.....	.....	.....	.....
Steel, billets, rods, " "	17	453	41	1,590
Tin..... " "	10	125	130	887
Tin and black plates, boxes.	.....	19,455	.....	48,530
Zinc (spelter).....long tons	28	150	45	470

*Metal Exchange Reports.

Baltimore.**	Week, Jan. 21.		Year, 1897.	
	Exp.	Imp.	Exp.	Imp.
Bismuth metal, cases.....	.....	.....	.....	.....
Chrome ore..... long tons	.....	.....	.....	.....
Copper, fine..... " "	769	.....	2,605	.....
" matte..... " "	.....	.....	.....	.....
" sulphate .. " "	606	.....	606	.....
Iron ore ..... " "	.....	.....	.....	8,321
" pigs, bars, ingots, blooms. " "	.....	720	80	720
Iron oxide..... bags	.....	.....	.....	.....
" pyrites.....long tons	.....	.....	.....	.....
Ferro-manganese " "	145	.....	323	.....
Ferro-silicon..... " "	.....	.....	.....	.....
Lead..... " "	.....	.....	.....	.....
Limestone.....short "	.....	.....	.....	.....
Manganese metal,long "	.....	1,610	.....	1,610
Spiegeleisen ..... " "	.....	.....	.....	125
Steel..... " "	.....	.....	.....	197
Steel wire, bundles.....	11	527	11	1,101
Tin, long tons.....	.....	36	.....	158
Tin and black plates, boxes	.....	.....	.....	320
Zinc (spelter) long tons....	.....	.....	.....	.....

**From our special correspondent.

Philadelphia.††	Imports.	
	Week. Jan. 8.	Year, 1897.
Antimony, casks.....	.....	.....
Copper ore, long tons.....	.....	.....
Ferro-manganese, long tons.....	.....	.....
Ferro-silicon.....	.....	.....
Iron ore, long tons	9,140	9,140
" pig " "	.....	.....
" pyrites, long tons.....	.....	.....
" and steel scrap, long tons.....	.....	.....
Manganese ore, long tons.....	.....	.....
Spiegeleisen " "	.....	.....
Tin ..... " "	25	25
Tin and black plates, boxes.....	1,768	1,768

†† From New York Metal Exchange Reports.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Jan. 22.

Heavy Chemicals.—Everything in this market continues to be reported dull, except bleaching powder, of which the arrivals have lessened because of the stringent conditions here, thereby decreasing stocks. We quote: Caustic soda, 60%, $2.22½@$2.42½; 70-74@76%, $2.12½@$2.22½ per 100 lbs. Alkali, 58%, 70@75c. for 50-ton lots and over, and 80@90c. for smaller quantities; 48%, $1@$1.20 for jobbing lots. Caustic soda ash, 48°, $1.50@$1.70. Bleaching powder, prime brands, $1.75@$1.87½; Continental, $1.62½@$1.75 per 100 lbs. Bicarb. soda, English, 1·75@2c. per lb.; American, bulk, $1.50@$3.50 per 100 lbs.; according to make. Sal-soda, English, 62½@67½c.; American, 65c. (in barrels), 80c. (in kegs) per 100 lbs. Hyposulphite of soda, 1·65@1·85c. in casks; 1·75@2c. in kegs.

Acids.—An improvement is noted during the past week in the demand for actual consumption, otherwise conditions remain much the same. There is a stiffening tendency in acetic acid, due to an advance of 10% in acetate of lime. Quotations per 100 lbs. in New York and vicinity in lots of 50 carboys or over are as follows: Acetic acid, commercial No. 8 (in barrels), $1.35@$1.45; in carboys, $1.40@$1.60; redistilled, 28%, in bbls., $1.65@$1.75; in carboys, $1.85@$2; muriatic acid, 18°, 75@85c.; 20°, 85@95c.; 22°; $1.15@$1.25, according to make and quantity. Nitric acid, 36°, $3.50@$4; 40°, $4@$4.50; 42°, $4.50@$5.50. Oxalic acid, $7.25 ex-dock and $7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66°, 85c.@$1 in carload lots, 10@15c. higher for small quantities. Chamber acid, 86@$6.50 per ton at factory. Blue vitriol, $3.75@$4 according to grade and order.

Brimstone.—Recent large arrivals and cargoes nearly due have lowered the spot price of best unmixed seconds to $20½, and of thirds to $19½. For shipment quotations are $20¼@$19¼. The market is reported quiet. The steamship *Victoria* is in port with a cargo of 1,300 tons, the steamer *Mathews* has just discharged 1,000 tons, and an arrival of 1,000 tons is expected before the end of the week.

Fertilizing Chemicals.—There is little change to report in this market since last week, trade still consisting mainly of small purchases. We quote as follows:

Sulphate of ammonia, gas liquor, $2.30 for shipment, and $2.32½ for spot; bone, $2.10 per 100 lbs. Dried blood, high grade Western, $1.80@$1.85 per unit New York; f. o. b. Chicago, $1.50@$1.55 per unit; low grade, fine ground, Western, $1.45@1.50 f. o. b. Chicago. Azotine, $1.70@$1.75 basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate 13%@15%, av. P_2O_5, 54@65c. per unit at seller's works in bulk. Dissolved bone black, 17%@18% P_2O_5, 85c. per unit. Acidulated fish scrap, $10, and dried scrap $19.50@$20, f. o. b. fish factory. Tankage, high grade, $14.25@$14.50 per ton; concentrated, $1.40 per unit, f. o. b. Chicago; New York, $20; low grade, $19. Bone tankage $19@$20; ground one, $21@$23. Bonemeal, $20@$22 50.

Sulphate of Potash: 90-95%, New York and Boston, $1.96½; Philadelphia, Baltimore and Norfolk, $1.98; Southern ports, $2.

Double Manure Salts: 1·03@1·05½c., basis of 48% chlorate high grade (basis 90%), 1·99½@2·03c., in bulk, 24@36% per unit O. P., 36½@38c.

Muriate of Potash: We quote: 1·78c. at New York and Boston, 1·79½c. Philadelphia, Baltimore and Norfolk, and 1·81½c. Charleston, Savannah, Wilmington and New Orleans, for 80@85% basis of 80%, in lots of 50 tons and upward.

Chlorate of Potash.—Conditions remain firm; the price is maintained as previously quoted, which is 8@8½c. according to quantity.

Kainit.—Quotations per ton of 2,000 lbs. are $8.80@$9.25 per ton for shipments; the same for bulk, ex-ship.

Nitrate of Soda.—Conditions remain much the same as previously reported, perhaps a little duller, but prices are firm, and we quote: For spot, 1·90c.; to arrive, 1·82½@1 87½c., according to position.

Liverpool. Jan. 13.

(Special Report of Joseph P. Brunner & Co.)

Although there is no activity in the general lines of heavy chemicals, prices are well supported, and in some cases even mark a slight advance.

Soda ash does not attract much attention. We quote nearest values for tierces, according to market, about as follows: Leblanc ash, 48%, £4@£4 5s. per ton; 58%, £4 5s.@£4 10s. per ton, net cash. Ammonia ash, 48%, £3@£3 10s. per ton; 58%, £3 5s.@£3 15s. per ton, net cash. Bags 5s. per ton under price for tierces. For the American market special terms would be quoted.

Soda crystals keep moving at £2 5s.@£2 7s. 6d. per ton, less 5% for barrels and 7s. less for bags.

Caustic soda is firmly held, and it is difficult to get any supplies outside the Union. We quote nearest spot range, as to market, about as follows: 60%, £6 5s.@£6 7s. 6d. per ton; 70%, £7 5s.@£7 7s. 6d. per ton, net cash; 74%, £8 2s. 6d.@£8 5s. per ton; 76%, £8 15s. @£9 per ton, net cash.

Bleaching powder is without special feature, except that outside makes are practically unobtainable, and £6 15s.@£7 per ton, net cash, may be called nominal spot range for hardwood packages, according to destination.

Chlorate of potash is inquired for, but without much business resulting, buyers not being prepared to pay makers' price of 4½d. per lb.

Bicarb. soda is firm at £6 15s. per ton, less 2½% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia shows a further improvement, and has advanced to £8 5s @8 10s. per ton, less 2½% for good gray 24% and 25%, in double bags f. o. b. here, as to quality.

Nitrate of soda is also better at £8 7s. 6d.@£8 10s. per ton, less 2½% for double bags f. o. b. here, according to quality.

Carb. ammonia, lump, 3d. per lb; powdered, 3¼d. per lb., less 2½%.

MINING STOCKS.

Complete quotations will be found on pages 105 and 107 of mining stocks listed and dealt in at:

New York.	Colorado Springs.	Paris, France.
Boston.	Duluth, Minn.	Mexico.
Philadelphia.	Helena, Mont.	Shanghai, China.
Baltimore.	Salt Lake, Utah.	Valparaiso, Chile.
Pittsburg.	San Francisco.	London, England.
Cleveland, page 106.	Denver, Colo.	British Columbia.

NEW YORK, Friday Evening, Jan. 22.

The local market shows a better feeling both as to prices and sales.

Transactions for the week at the Consolidated Stock and Petroleum Exchange and the New York Stock Exchange aggregated 26,385 shares. At the New York Mining Exchange sales for the four days ending January 21st amounted to 44,450 shares, principally Cripple Creek stocks.

The Comstock shares show advances of from 5 to 25c., due to the upward tendency of the San Francisco market. Most of the assessments levied by these companies have been cleared, consequently higher prices are being quoted on the stocks.

The California group was quiet, although there was some heavy selling of Standard.

The Colorado stocks continue in request, and there has been some notable dealing in the Leadville stocks owing to rumors that the miners' strike had been settled. The Cripple Creek stocks also show heavy transactions, but prices show a declining tendency at the close.

The Utah stocks Daly and Ontario were dealt in sparingly this week. The Ontario Mining Company declared its 210th dividend of 10c. per share ($15,000), payable January 30th at the office of the transfer agents in New York.

Boston. Jan. 21.

(From Our Special Correspondent.)

The market for the copper shares has been buoyant all the week and prices have reached the highest point for many months. This activity and advance is due in a large measure to the strength of ingot copper both here and abroad, as well as to the fact that the Boston public have always looked with favor upon this class of securities. Boston and Montana announced early in the week a dividend of $3 per share, which advanced the stock to $104, the highest point of record. Yesterday it sold ex-divided at $100¾, and advanced to $104, thus more than recovering its dividend. After such an advance a reaction was only natural, and to-day it sold off to $102¼, recovering to $103.

Calumet & Hecla sold up to $345, ex-dividend $15, equal to $360, the highest on record. Quincy was only moderately active, but scored an advance of $3, to $126, and held it. The scrip sold up to $107½, an advance of 3½ points.

Tamarack was in active demand and advanced from $98 to $116½, reacting to $114½ to-day, but closing at $115. Atlantic declared a dividend of $1 per share and the stock was in demand, advancing from $23 to $26, with only a slight reaction. Osceola had a good advance, selling up from $29⅝ to $34½, losing a fraction only in to-day's sales. Kearsarge also had quite a boom, advancing from $17½ to $20¾, with natural reaction to-day to $19⅝. The report of a rich find in the Franklin, Jr., mine caused good buying of Franklin, which advanced from $12 to $14, closing firm. Butte & Boston was very active, the stock selling at 87@88½, assessment unpaid, and $10⅞ first assessment of $2½ paid. Centennial advanced from $3⅜ to $5½, assessment paid, closing at $5¼.

Tamarack, Jr., was quiet, but firm at $17½@$19. Wolverine took a start with the rest of the market and advanced from $9 to $10¼, losing the fraction only. Old Dominion, from some reason, has not participated to any extent in the advance, but sold from $16¾ to $17½, closing at $17. Arnold sold from $2½ to $3, and Tecumseh at $3.

The gold stocks have not shown much activity, but have ruled steady and firm. Pioneer sold at $5\frac{3}{4}$@$5. Gold Coins $3\frac{1}{2}$@$4, closing $3\frac{3}{4}$. Santa Ysabel was steady at $11\frac{1}{4}$@$11\frac{1}{2}$, and Merced at $7\frac{1}{2}$@$7\frac{5}{8}$.

3 p. m.—The market was a little heavy, after the noon hour. Boston & Montana declined to $101\frac{1}{2}$, rallied to $103 and closed at 102\frac{1}{2}$. Tamarack declined to $114. Quincy was firm at $126 and the scrip at $107. Calumet & Hecla touched $350 for three shares and seven shares sold at $345. Osceola fell off to $33 and Kearsarge to 19\frac{1}{2}$.

Cleveland. Jan. 20.

(From Our Special Correspondent.)

Interest in mining stocks was indicated during the past week by frequent inquiries, but that is about all that can be said of the market. The brokers are considerably encouraged over the outlook and are of the opinion that they will do a large volume of business when the season opens. During the week Lake Superior and Minnesota stocks dropped a few points, while Jackson stock advanced.

Salt Lake City. Jan. 16.

(Special Report of James A. Pollock.)

Good business characterized the week in the local mining stock market, the buying being heavy both on local and outside orders. Some violent changes were noted in several of the stocks, but the close was firm with the tendency upward. A continued steady advance was noted by Ajax, and at the close the stock was higher than it has been for some months. Anchor was in fair demand, but the offerings were light, and buyer and seller remained apart. Centennial-Eureka paid the usual dividend of $1 per share on the 15th. The stock was not offered on the market. The Dalys remained practically unchanged. Sellers of these stocks are not numerous. Dalton was somewhat weaker on limited business. Dalton & Lark did little, with offerings slightly lower. Four Aces remained stationary. Little Pittsburg displayed more life than for some time past, and advanced somewhat in the bidding.

An option running to March 22d has been given on the Mercur at the rate of $7.50 per share, the sum of $25,000 having been paid as forfeit money. The minority have been invited to join with the majority in the pool and indications are that nearly all of the stock will be tied up, stockholders being of the opinion that $7.50 per share is better than to take chances with an unknown management. Northern Light was as active as during the previous week and a steady advance occurred in the stock. Ontario was in fair demand, with only limited offerings. Rover did some business at the old figures. Sunbeam changed but little. On the 11th the Silver King paid its regular monthly dividend of 25c. per share. A concerted selling movement broke Swansea down below the $2 mark, but stop orders sent the price back in the neighborhood of $2.52 at the close. Out of sympathy with its neighbor, South Swansea also broke, but the close was slightly stronger. The company pays 5c. on the 21st. Sunshine was in somewhat better demand and quotations were stronger.

San Francisco. Jan. 16.

(From Our Special Correspondent.)

The market opened on Monday rather quietly, though there was no decline in prices, and rather a tendency to firmness. This did not last, however, and by the middle of the week the market was dull again, and prices for all the Comstocks were weak. The only stock showing any strength was Standard Consolidated.

On Thursday there was a small decline in the Comstocks, followed by a recovery in the afternoon. The whole affair, however, was on small dealings. In the same way a rise was worked up at the end of the week and prices were firm at the close.

The annual election of the San Francisco Stock and Exchange Board was held January 11th, and resulted in a return of all the old officers, as follows: President, A. G. Gurnett; vice-president, Emmett P. Barrett; secretary, Fred W. Hadley; treasurer, George T. Marye, Jr., and chairman, Oscar V. Walker. The old committee on membership was also re-elected, as follows: A. J. McDonnell, Charles E. Paxton, James Paterson, Charles D. Laing, H. H. Shinn, Charles H. Stoutenborough and J. R. Fitch. The standing committees have been appointed as follows: Executive Committee: H. L. Van Wyck, C. W. Fox, W. Edwards, George I. Ives, M. J. McDonald. Finance committee: A. B. Ruggles, R. W. Heath, W. F White. Stock List committee: R. F. Rogers, Werner Stauf, E. Epstein, H. G. Kuhl, S. Dixon. Committee on commissions and rules: George W. Kelley, John McKenzie, A. F. Coffin.

At the annual meeting of the stockholders of the Bullion Mining Company, of Nevada, on January 14th, the old directors were re-elected excepting Charles H. Fish, who resigned, and George Snider was elected to fill the vacancy. The old officers were re-elected, including Thomas Cole, president; Charles Hirschfield, vice-president; R. R. Grayson, secretary, and Roger Prendergast, superintendent.

The following new applications to mine by hydraulic process have been received by the California Debris Commission: S. J. Holsinger, in the Drummondsville mine, near Forest Home, Amador County, to deposit tailings in Drummondsville Creek, and G. D. Duncan & Co, in Pebble Bottom mine, near Yankee Jim's, Placer County, to deposit tailings in a ravine.

British Columbia.

(From Our Special Correspondent.)

ROSSLAND, Jan. 14.

There is a decided feeling which is constantly growing throughout the Kootenay district and the province generally in favor of more stringent regulations respecting the projecting and flotation of mining schemes and companies intended to operate in this field.

I find on the streets, in the mines and among business men a very cheerful feeling. The future—that is, the developments of the next few months—is constantly referred to, and what has lately added to the hopeful nature of the situation is the strong backing which the camp has begun to receive in the Eastern provinces. This confidence may be abused in some cases, but it is respected and appreciated in the great majority of instances.

The camp is constantly receiving valuable accessions to its number of men of first-class prominence and respectability, who are not coming here merely to speculate and go away with the profits, but who are coming here to live and benefit by the change.

London. Jan. 9.

(From Our Special Correspondent.)

Business in the stock market has been very restricted all the week. The public have not been buying at all and operations have been confined entirely to the professional element. There have been plenty of events during the week to cause speculation, so that an absence of business shows how utterly tired the public are of the mining market. During the earlier part of the week there was a little revival of inquiry for South African gold stocks and the market immediately hardened. After prices had advanced two or three points dealers brought on the market immense blocks of stock, which they have been keeping for a rise, and prices were again depressed. Afterward the dealers who had laid in a good supply of stock at the end of last year, in the hopes of a favorable turn with the New Year, showed signs of disappointment, and some of them began to get rid of their holdings. This brought about, of course, an additional fall. The bears took the opportunity of exaggerating Mr. Rhodes' remarks about the expansion of empire in South Africa, and President Krueger's attitude regarding it. They gave out that they considered that the quarrel between Krueger and Rhodes was going to break out again in a virulent form, and that both Rhodesian stocks and Transvaal gold stocks would suffer a serious setback. These bear tactics were not very successful because, although everybody felt that Mr. Rhodes had been injudicious, no serious consequences would result.

The production of gold in the Rand during December amounted to 206,517 oz., this bringing up the production for the year 1896 to 2,281,874 crude ounces, a gain of 4,239 oz. over the total for 1895. A mine which is showing well is the Geldenhis Deep, at which the returns for December were 13,300 tons crushed yielded 4,016 oz., 10,550 tons treated by the cyanide process yielded 2,827 oz., while the profit for the month was £5,867. The better yield of the ore is due to sorting, which at first was thought to be unnecessary. The Chartered Company has decided to issue the remaining 500,000 shares, being the balance of the 1,000,000 shares by which the capital was increased in November last. The shares are to be offered as before at £2 each, preference being given to the present shareholders. There is no doubt at all that the whole of the issue will be taken up at once, as the special object for the money raised is to extend the Bechuanaland Railway to Buluwayo and to construct the connecting line between Beira, Umtali and Salisbury. It is understood that the Cape government will undertake the management of these Rhodesian railways for a long term of years and that their construction will be pushed on very rapidly. While it is true that this issue has been received favorably, it must be said that some irritation was caused in the market temporarily, because it was totally unexpected. During the first day the jobbers felt inclined to bang the shares; but when it was found out that the issue would be taken up without difficulty they changed their tactics and the quotation rose speedily to £2 10s.

The West Australian section has been rather more lively and some buying has taken place on the part of the public. The chief cause of this has been the announcement of a discovery of telluride ore at Great Boulder Main Reef. The directors have heralded this discovery with a great blowing of trumpets, but as they do not say anything about the quantity of such ore in sight the value of the discovery is doubtful.

A week or two ago I mentioned that the London and Paris and the Exploring and Finance, two companies belonging respectively to the Barnato and Whitaker Wright circles were to be amalgamated. It now appears that the terms of the amalgamation cannot be agreed on and that the negotiations are off.

The section of the market in which most business has been done is the Indian. These shares have all been strong, chiefly on the publication of the returns for December and for the year 1896. Owing to the high price of the Mysore and Champion Reef shares, which are now about £9 each, it has been decided to split each £1 share into two of 10s. each. This will considerably facilitate buying.

The New Zealand section is unfortunately quite dead and there is no prospect of any revival just yet. The American and British Columbian sections are also in the background, and there is no encouragement to promoters to bring their propositions forward. During the past week or two there has been some demand among good houses for Californian mines.

MEETINGS.

Bushwhacker Mining Company, at the office of the company at Aspen, Colo., on February 9th, at 2 p. m.

Cripple Creek & Clear Creek Mining Company, at Denver, Colo., on February 5th, at 2 p. m.

Cumberland Coal Company, at 213 E. German street, Baltimore, Md., on January 26th, at 12 m.

De Beers Gold Mining Company, at 428 Mining Exchange Building, Denver, Colo., on February 8th, at 2 p. m.

Gold Button Mining and Milling Company, at 620 Mining Exchange Building, on January 30th, at 2 p. m.

Great Eastern Gold Mining and Milling Company, at 307 McCornick Building, in Salt Lake City, Utah, on February 13th.

Little Pittsburg Mining Company, at 204 Progress Building, Salt Lake City, Utah, on February 8th, at 7:30 p. m.

Mammoth Mining Company, at 310 Atlas Building, Salt Lake City, Utah, on February 2d, at 2 p. m.

Olympia Mining Company, at 1,066 South Eighth street in Denver, Colo., on February 6th at 8 p. m.

Piegan Mining and Milling Company, in Marysville, Mont., on February 8th.

Pilgrim Gold Mining Company, at 611 Mining Exchange Building, Denver, Colo., on February 2d, at 10 a. m.

Sombrerete Mining Company, at 42 Pine street, New York City, on February 2d, at 12 m.

MISCELLANEOUS DIVIDENDS.

Consolidation Coal Company, Md., dividend of $2 per share, payable at the office of the company, 71 Broadway, New York. February 1st. Transfer books close January 26th and reopen February 2d.

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Dlnq.		Sale.		Amt.
Alta Silver	Nev.	54	Jan.	18	Feb.	8	.05
Anna Gold	S. D.	6	"	27	"	15	.02
Beaver Creek	Mont.	....	"	17	"	23	.02
*Bullion	Nev.	49	Feb.	18	Mar.	11	.10
Butte & Phila.	Mont.	....	Jan.	12	Jan.	29	.002½
Central Eureka	Cal.	4	"	23	Feb.	15	.03
Con. Cal. & Va.	Nev.	7	"	14	"	4	.25
Crown Point	"	69	"	18	"	3	.10
East Gold'n Gate	Utah	....	"	22	"	1	.00½
Far West G. & S.	S. D.	11	"	9	Jan.	30	.003
Gould & Curry	Nev.	80	"	19	Feb.	1	.15
Gray Eagle	Cal.	....	"	30	"	23	.05
Hale & Norcross	Nev.	110	"	11	"	1	.25
*Horseshoe Bar Con.	Cal.	6	Feb.	6	"	27	.20
*Larkin	"	....	"	15	Mar.	15	.05
Orleans	"	....	Jan.	11	Feb.	2	.10
*Pine Hill	"	9	"	18	"	8	.05
Red Cloud	Utah	6	Dec.	31	"	1	.02
*Sevier	"	....	Feb.	11	"	27	.05
Sheep Rock	"	....	Jan.	9	Jan.	30	.10
Savage	Nev.	91	"	26	Feb.	15	.20
Snowflake	Utah	....	Dec.	29	Jan.	22	.01
*Teresa	Mex.	17	Feb.	5	Feb.	23	.05
Tetro	Utah	4	Jan.	30	"	20	.01

*New assessment.

DIVIDENDS.

NAME OF COMPANY.	Current Dividends. Date.	Current Dividends. Amt.	Paid since Jan. 1, 1897.	Total to date.
Anchoria-Leland	Jan. 15	$6,000	$6,000	$336,000
Atlantic Copper	Feb. 10	40,000	40,000	740,000
Boston & Montana	Jan. —	450,000	450,000	5,375,000
Bullion Beck	" 20	20,000	20,000	1,967,000
Calumet & Hecla	Feb. 10	1,500,000	1,500,000	48,350,000
Centennial Eureka	Jan. 15	30,000	30 000	1,890,000
Coronas	" 1	1,500	1,500	6,500
Della S.	" —	10,000	10,000	60,000
Elkton Con.	" 20	25,000	25,000	191,960
Florence	" —	3,696	3,696	118,096
Galena	" 10	5,000	5,000	71,000
Gold Coin	Feb. 1	20,000	20,000	120,000
Homestake	Jan. 25	31,250	31,250	6,118,750
Last Chance	" —	20,000	20,000	40,000
Le Roi	" —	25,000	25,000	275,000
Mercur	" 20	25,000	25,000	600,000
Mont. Ore Pur. Co.	" 15	40,000	40,000	520,000
Napa Con	" 2	10,000	10,000	820,000
N. Y. & Honduras Rosario	" 15	15,000	15,000	690,000
Ontario	" 30	15,000	15,000	13,370,000
Osceola	Feb. 1	50,000	50,000	2,122,500
Portland	Jan. 15	30,000	30,000	893,600
Silver King	" 11	37,500	37,500	900,000
South Swansea	" —	7,500	7,500	15,000
Swansea	" 10	5,000	5,000	26,500
Totals		$2,422,356	$2,432,356	$84,616,206

NOTE.—This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the *Engineering and Mining Journal* will confer a favor on the publishers if they will notify the *Journal* of any errors or omissions in the above table.

STOCK QUOTATIONS.

NEW YORK.*

NAME OF COMPANY.	Location.	Par val.	Jan 16. H.	Jan 16. L.	Jan 18. H.	Jan 18. L.	Jan 19. H.	Jan 19. L.	Jan 20. H.	Jan 20. L.	Jan 21. H.	Jan 21. L.	Jan 22. H.	Jan 22. L.	Sales
Alamo	Colo	1					.05								1,000
Anaconda	"	5													
Bedford Con	Mont.														
Belcher	Nev.	100													
Best & Belcher	"	100													
Brunswick	"	1									.20				1,000
Challar	Nev.	100													
Chrysolite	Colo.	25					.10		.11	.09					2,300
Comstock T	"	100	.05		.05										2, 00
Con. Cal. & Va.	"	100							1.65						100
Con. Imperial	"	1													
Creede & C. C.	Colo.	1	.07		.07		.07				.06				3,300
Cripple Cr. Con.	"	1			.13		.13		.13				12		1,600
Crescent	Utah	25													
Crœsus	Colo.	1							.02		.02		.02		3,000
Crown Point	Nev.	100													
Daly	Utah	20											4.50		10
Father de Smet	"	100													
Gold Coin	Colo.	1													
Golden Fleece	"	1													
Gould & Curry	Nev.	100													
Hale & Norcross	"	100	1.25												200
Homestake	S. Dak	100													
Horn Silver	Utah	25													
Iron Silver	Colo.	20			.34	.33					.30				2,400
Isabella	"	1													
King & Pemb.	Ont	10									.24				100
Lacrosse	Colo.	10	.09								.09				500
Leadville Con.	"	10							.10						1,000
Little Chief	"	50													
Mexican	Nev.	100			.55				.55						400
Mollie Gibson	Colo	5													
Mt. Rosa	"	1	.15	.12	.14		.14		.12		.12		.12		3,100
Ontario	Utah	100									10.50		10 25		50
Ophir	"	100													
Pharmacist	Colo	1			.16				.15		15		15		2,200
Phœnix Con	A iz	100													
Potosi	Nev.	100													
Quicksilver	Cal	100													
" pref.	"	100			11 75										275
Savage	Nev	100													
Sierra Nevada	"	100													
Sm. Hopes Con	Colo.	20													
Specimen	"	1													
Standard Con	Cal	100	1.45		1.50						1.60	1.50			1,350
Syndicate	"	100													
Union Con	Nev.	100													
Utah Con	"	100													
Victor	Colo.	5													
Work	"	1					.01								500
Yellow Jacket	Nev.	100													

*Official quotations N.Y. Stock and Con. Stock & Petroleum Exchs. Total shares sold. 26,385.

INDUSTRIAL COAL AND COAL RAILROAD.*

NAME OF COMPANY.	Par value.	Jan. 16. H.	Jan. 16. L.	Jan. 18. H.	Jan. 18. L.	Jan 19. H.	Jan 19. L.	Jan. 20. H.	Jan. 20. L.	Jan. 21. H.	Jan. 21. L.	Jan. 22. H.	Jan. 22. L.	Sales
Balt. & Ohio	100	16		18¼		16⅜		16		15¾	15	15¼	14¼	3,300
Ches. & Ohio	100	18⅜	17¾		18	18		18	17⅝	17⅛	16¾			10,500
Col.C.& I.Dev	100													
Col. Fuel & I.	100	25⅝	24⅛	26⅛	25	25	24	27	26¼	25⅝				5,815
Col.,H.V.&Tol	100	16⅜	16⅛	17⅜	.7	17	16⅞			14	8¼	11⅝	9	9,700
do. pref.	100													
Col. & H.Coal	100													
Del. & Hud. C	100	112⅛	111⅜	112⅝	111⅝			111⅜	110⅝	111¼	110¼	110¾	107⅝	12,815
Del., L. & W.	50			157⅜								155¼		300
General Elec.	100	35	24¼	35⅝	34⅝	35⅜	34⅝	35		34¾	34½	35¼	34	19,814
Lake Erie&W	100			18⅝										100
do. pref.	100	68			70			70¼	70	69⅝		70¼		2,075
Morris&Essex	100													
Nat'l Lead	100	26	27½	25¼	26	26⅜	25	25¾		26	25¼	24¼		1,401
do. pref.	100	90	89⅜					89⅜						480
N. J. Central	100			103¾	102	103¼	102	103⅜	100⅜			101⅝	99¼	4,150
N. Y.,L.E.&W	100													
do. pref.	100													
N.Y.,Ont.&W.	100	15¼	15⅛	15⅜	15⅛			15¼	15⅛	15	14⅞	15	14⅞	2 973
N.Y.,Susq.&W	100			9¾				9⅛	8⅝	8¾	8	8		1,815
do. pref.	100	23¼	25	26⅝	25¾	25¾	25¼	25¼	22¾	24	23¼	23¾	22⅞	10,190
Norfolk & W.	50													
do. pref.	50													
Phila. & Read.	50	27¾	27⅜	28⅛	27⅝	28	27⅜	27⅝	25⅞	27¼	2 3/4	26¾	26¼	89,610
Tenn. C. & I.	100	30¾	30¼	31	29⅝	30⅝	30	30⅝	29½	30	29	29⅝	28¾	21,080
do. pref.	100													
Wheel. & L. E	100	3	2¼	3	2	2¾	2⅛	2⅜	2¼			2¼		12,475
do. pref.	100							11						110

* Official quotations N. Y. Stock Exchange. Total shares sold, 158,535.

BOSTON. MASS.*

NAME OF COMPANY.	Location.	Par val.	Jan 15. H.	Jan 15. L.	Jan. 16. H.	Jan. 16. L.	Jan. 18. H.	Jan. 18. L.	Jan. 19. H.	Jan. 19. L.	Jan 20 H.	Jan 20 L.	Jan. 21. H.	Jan. 21. L.	Sales
Allouez	Mich.	25													
Arnold	"	25	2.5	2 25	2.50		3 00	2.75	3 0	2.75	3.13	2 75	3.00		6,477
Atlantic	"	25	24.00	23 00	24.50	24.00	25.00	24.88	25.00	24 50	26 00	25.00	25.75	24.88	5,512
Bost. & C. C.	Colo.	1									10				1,000
Bost. & Mont.	Mont.	25	10 5⅛	98 50	101⅜	100⅛	103	102	104	102¼	104¾	103⅛	104	101¾	26,627
Butte & Bost	"	25	7 01	6.25	7.63	7.25	8.50	7 88	8.13	7.50	1 88	8.00	10.75	9.88	35,379
Cal. & Hecla	Mich.	25	340	339			345		345		345		350	345	64
Centennial	"	25	3.63	3.43	4 00	3.75	5 00	4.50	5.00	4 63	5.63	5.00	5.75	5.00	9,675
Dominion Coal	N. S.	100	9 50		10 00	9.50	10.00		9.88	9 50			9.50		2, 64
" pref.	"	100	84 00		84.00		84 00				85 00				64
Franklin	Mich.	25	14.5		12.00		13.00		12 13	12.00	14 00	12 25	14.00	13 75	2,125
Gold Coin	Colo.	1	4 00	3 90	3 93	3 88	3 93	3 63	3.50		3 75	3.50	3.88	3.75	3,181
Illinois Steel	Ill.	100	37.00	35.00			42.00	40.00	39 50		4.00	38 00	38 50		2,074
Kearsarge	Mich.	25	18.00	17.50	18.25	18.00	19.00	18 38	19 00	18 75	20.75	19.25	21.00	19.50	7,295
Lake Sup. Iron.	"	25	2 50												50
Merced	Cal.	15	7.75	7.63			7.88	7.75	7.50		7.63	7.50	7.50	7.38	1,455
Minnesota (Ir.)	Minn.	100													
Napa	Cal	7													
National	Mich.	25													
Old Dominion	Ariz	2	17.00	16.75	17.50	17.25	17.75	17.38	17.50		17.50	16 75	18.25	16.75	5,430
Osceola	Mich.	25	29.63		31.00	30.00	31.00	30.50	32.50	31.50	34 25	32.50	35 00	32 75	5,694
Pioneer	Cal.	10			5.75		5.75				5.13	5.00	5.00		300
Pontiac	Mich.	25													
Quincy	"	25			128		128	124	125	124	125	124¾	126	123¾	726
do. scrip	"		105	104	105		106	105⅜	1 6⅛		1.97	106⅜	107⅜	106⅛	348
Santa Rosa	Cal.	10													
San. Ysabel (G.)	"	5	11 50				11 38		11.25		11.50	11 25	11.50		1,100
Tamarack	Mich	25	98 50	98.00	101	98.00	102	101	196	102½	116¼	109¼	118	114	1,625
Tamarack, Jr.	"	25			18 00	17.50			18 00		19.00	18 25			760
Tecumseh	"	25	3.00		3.00		3.00				5.00		3.00		575
Westingh E.&M	Pa.	50					24 00	23 50	24.50	24.00	24.25				493
do. pref.	"	50	51.50						51 00				51.00		86
do. scrip	"														
Wolverine	Mich.	25	9.25	9.00	9.25	9.13	9.25		9 93	9 25	10.25	9 43	10.50	9.50	11,252

*Official quotations Boston Stock Exchange. ‡Ex-dividend. Total sales, 131,634.

SAN FRANCISCO, CAL.*

NAME OF COMPANY.	Location.	Par. value.	Jan. 15	Jan. 15	Jan 8	Jan. 19	Jan. 20.	Jan. 21
Alta	Nev.	100	.09	.09	.09	.09	.08	.08
Belcher	"	100	.49	.48	.48	.49	.47	.47
Belle Isle	"	100						
Best & Belcher	"	100	.67	.68	.78	.70	.72	.73
Choliar	"	100	.91	1.00	.95	.85	.93	.93
Con. California & Virginia	"	100	1.50	1.55	1.70	1.60	1.80	1.85
Crown Point	"	100	.36	.34	.35	.33	.33	.35
Gould &Curry	"	100	.49	.48	.49	.47	.49	.51
Hale & Norcross	"	100	1.25	1 23	1 35	1.20	1.30	1 25
Mexican	"	100	.47	.46	.51	.47	.49	.50
Ophir	Nev.	100	1 05	1.05	1.15	1.05	1.10	1.15
Potosi	"	100	.65	.63	.65	.59	.61	.61
Savage	"	100	.25	.27	.29	.26	.27	.26
Sierra Nevada	"	100	.48	.46	.52	.49	.50	.50
Standard	Cal.	100	1.55		1.50		1.40	1 50
Union Con	Nev.	100	.42	.45	.46	.46	.46	.46
Utah	"	100	.07		.07	.05	.05	.05

COLORADO SPRINGS, COLO.

NAME OF COMPANY.	Par val	Jan 11. H.	Jan 11. L.	Jan. 12. H.	Jan. 12. L.	Jan. 13. H.	Jan. 13. L.	Jan. 14 H.	Jan. 14 L.	Jan. 15 H.	Jan. 15 L.	Jan. 16 H.	Jan. 16 L.	Sales.
*Ajax	$1													
Alamo	1			.05¾		.05¾		.06¼				.05¼		14,000
*Am'ric'nC	1									.04¾	.04	.04¾	.04	6,000
*naconda	5	.90	.88¾	.90¾				.91		.91⅜		91⅜		2,500
*Aola	1													
Arg'ntumJ	2	.41	.40	41		.44	.43	.44						4,800
Bangkok	1													
*Bankers	1							.11	.10					1,500
Banner	1							.03⅛		.03⅛				6,000
*Ben Hur	1													
*Blue Bell	1													
Bob Lee	1			.01⅜				.01⅜						20,000
Bost. & C.C.	1													
*Buckhorn	1			.03⅜	.03			.03⅜	.03	.03⅛	.03	.03⅛	.03	18,000
*Colo.C.&M	1													
Columbine	1													
Copper M	1													
Cr. & C. C.	1	.06⅛	.06⅛	.06⅜						.06⅜	.06¼	.06¼		17,500
C. C. Con.	1	.12½		.12⅝	.12⅜	.12¾		13⅛	.12⅜	.13⅝	13⅜	.13½	.12⅝	24,900
Cr.Cr.Exp.	1							.11						100
Crœsus	1													
*Dante	1													
Des Moines	1				.02¾			.02¼						3,000
*Enterprise	1													
Fanny R.	1	.07⅜		.07⅞		.07⅜		.07¼	.07⅜			.09½	.08¾	9 ,750
Favorite	1	.07½	.07					.07						5,000
Franklin	1											.07⅜		5,000
*Garfield-G	1	.08¾	.08½	.08¾	.08⅜							.09¾	.09¼	7,000
*Gold. Age	1													
*Gold.E'g'e	1			.02½	.02⅛									1,000
Gold Fl'ce	1									.95				100
Gold & Gl	1			.12⅜										1,000
Gold King	1													
*GoldStand	1			.04¼								.04¼		7,000
*Gould	1											.08¾	.07	5,000
Grotte	1													
Henrietta	1													
*Humboldt	1													
Ida May	1													
Ingham,C.	½	.14		.14								.14⅜		3,500
*Iron Clad	1													
Isabella	1	.47⅝	.46½	.1½	.48	.54⅜	.51	.55⅜	.53	.55⅜	.53	.53⅜	.52	207,925
do.stamp	1	.46⅝	.45½	.50⅜	.48½	.53¼	.50¾	.54¼	.53⅛	.54⅜	.52½	.52	.51	39,000
Jack Pot	1	.06⅜		.06⅜	.06¾	.06⅜		.06⅜		.07		.06¾		31,375
Jefferson	1													
*Keystone	1													
Ladessa	1													
L'nc'lnB'y	1													
LottieGib	1													
Marion	1	.007												1,000
Matoa	1				.09	.08¾	.09⅜	.09½	.10⅜	.10¾	.10¼	.10⅜	.09	26,300
Mollie G	5	.59	.57	.56½		.55	.54⅜	.54	.53⅜	.53		.58½	.53	7,300
Monarch	1			.04¾	.03⅞									4,000
Mt. Rosa	1					.11¾		11⅜	.11⅜	.12	.11⅜			5,000
Mutual	1													
Nugget	1													
*Ophir	1	.08½	.08⅜					.08						13,000
Oriole	1							.02				.01⅞		2,000
*Orphan B	1									.11	.09½			1,100
*Pappoose	1													3,000
Pharmacist	1	.14⅜	.14½	.03	.02									60,500
Portland	1			1 33	.14⅜	.15¼	.15⅜	1.34	1.30	.15⅜	.15	1.33	1.31	1,614
*Princess	1			.03¼		.03¾	.03⅜			.03⅝	.03⅜	.04½	.04¼	59, 67
*Reno	1					.04¾	.04¼	.04½				04½		4,000
*Sacram'to	1													
Silver St	1													
Specimen	1	.08				.07								7,000
*Sq'wMt.T	1													
*Temonj	1													
Trachyte	1							(2⅛		02⅛	.03⅜	02⅛		31,000
nion	1	.31½	.31	.31⅜	.31⅝	.31¼	.30¾	.3 ¾	30⅛	.30⅜	.30	.3 ⅜	.30¼	98,640
Virginia M.	1													
Work	1	.08	.07⅜	.07⅛						.07⅜		.07¼		4,000

*Official quotation; Colo. Springs Mg. Stock Assoc; *Board of Trade Exchange. Total shares sold, listed, 850,371; unlisted, 885,000. Sales given are those made at both exchanges.

CLEVELAND.

NAME OF COMPANY.	Par value.	Jan. 20. Bid.	Jan. 20. Ask.	NAME OF COMPANY.	Par value	Jan. 20. Bid.	Jan. 20. Ask.
Aurora	$25		$8	Lake Superior	$ 5		$30
Chandler	25	$35	40	Manhattan	100		52
Clevelan Cliffs Iron	100	40	45	Pittsburg & L'ke Angeline	25	$3	
Jackson	25		75	Republic	25	5	20

BALTIMORE, MD.* Week ending Jan. 8.

NAME OF COMPANY.	Location.	Par value	Bid.	Ask.	NAME OF COMPANY.	Location.	Par value	Bid.	Ask.
Balt. M & S.	N. C.	5			Howard C.&C	Md.	5		
Conrad Hill	"	10			Lake Chrome	"	5		
Con. Coal	Md.	100	56		Ore Knob	"	10		
G. Cr'k Coal	"	100	105	110	Silver Valley	N. C.	5		

*Official quotations Baltimore Stock Exchange.

CHICAGO.*

NAME OF COMPANY.	Location	Par value.	Jan 7	Jan 8.	Jan 9	Jan 11.	Jan 12.	Jan 13
Annapolis	Colo.	1						
Boston & Col.	"	1						
Capazona								
C. C., G. M. B. & L								
C. C. Gold Group	Colo.							
Chicago & Montana	Mont.	10						
Cosmopolitan	Utah.							
Finance								
Imperial pfd								
Iron Mountain	Mont.							
Isabella	Colo.	1						
Jefferson	"	1						
Ju tice	"	1						
Lucile	Cal.							
Michigan	Mich	25						
P erless	Nev.							
Pharmacist	Colo.	1						
Portland	"	1						
Rhyolite								
San Pedro	N. Mex							
Squaw M untain	Colo.	1						
Su perior								
Sunnyside Gilpin								

*Official quotations, Chicago Stock and Mining Board.

BRITISH COLUMBIA. Week ending Jan. 16.

NAME.	Selling price.	NAME	Selling price.	NAME.	Selling price.
Boundary Creek:		**Trail C'k** (con.):		**Trail C'k** (con.):	
Old Iron Sides	$0.12	Caledonia Con	$0.11	Little Darling	$0 05
C'p McKenney:		California	.5	Mabel	.05
Cariboo M.& S.Co.	.47	Camp Bird	.05	Mayflower	.14
Ainsworth & Nelson Dis.:		Commander	.25	Monita	20
		Crown Point	.36	Monte Cristo	.16
Delia M. & M. Co	.12	Deer Park	.22	Morning Star	.10
Colville Res.:		Dewdney	.06	Mug Wump	.15
Birton	.05	Enterprise	.20	Nest Egg	.09
Fidelity G. & C.Co	.10	Evening Star	.20	Northern Bell	.15
Joe T. Gold M. Co	10	Georgia	.04	O. K	.30
Mountain View	.16	Good Hope	.18	Orphan Bell	.15
Idaho District:		Great Western	.18	Ottawa	.05
Oro Pinar Placer	.12½	Hattie Brown	.08	Palo Alto	.09
Daisy Group	.10	Helen	.15	Phœnix	.4
Slocan Dis.:		High Ore	.07	Poorman	.19
Idler	.07½	Hill Top	.10	Red Eagle	1
Noble Five Con	.62	Homestake	.17	Red Mt. View	.12½
Slocan Star	2.35	Imperial	10	Rossland Red Mt.	.25
Trail Creek:		Iron Mask	55	St. Elmo	11
Alberta	.10	Iron Coat	.15	Silver Bell	.08
Big Chief	.07	Ivanhoe	.10	Silverine	.12
Big Eagle	.05	Josie	57	So. Cross & Wolver. C.	.10
Big Three	.10	Jumbo	.60	St Paul	.10
Blue Bird	.10	Josie Mac	10	War Eagle Con	1.66
Butte Gold-Copper	.07	Le Roi	7.50	West Le Roi	.20

LONDON. Jan. 8.

NAME OF COMPANY.	Country.	Product.	Capital stock.	Par value.	Last dividend. Amt.	Last dividend. Date.	Quotations. Buyers	Quotations. Sellers.
				£ s. d.	s.d.		£ s. d.	£ s. d.
N'th Americans:								
Alaska-Mexican	Alaska	Gold	£200,000	1 0 0	0 4.8	Oct. 1896	1 2 6	1 7 6
Alaska-Treadwell	"	"	1,000,000	5 0 0	1 6	"	4 5 0	4 10 0
De Lamar	Idaho	Gold&silver	400,000	1 0 0	1 0	Nov., "	6 6	7 6
Hall Mines	BritishCol	Cop.&Silver	250,000	1 0 0			1 8 9	1 11 3
Montana	Montana	Gold&silver	600,000	1 0 0	0 3	June, 1896	3 9	4 3
Palmarejo	Mexico	" "	800,000	1 0 0			1 0	1 6
Pinos Altos	"	" "	100,000	1 0 0			1 3	3 9
Plumas-Eureka	California	Gold	281,250	2 0 0	0 6	Oct., 1896	2 6	2 6
Richmond	Nevada	G'ld,sil.le'd	270,000	5 0 0	1 0	Dec., 1896	12 6	17 6
Sierra Buttes	California	Gold	245,000	2 0 0	0 6	Apr., 1896	2 6	7 6
Springdale	Colorado	"	200,000	4 0	0 2	Sept., 1894	3	9
S'th Americans:								
Colomb. Hydra'lic	Colombia	Gold	75,000	1 0 0	1 0	July, 1895	7 6	10 0
Frontino & Bolivia	"	"	140,000	1 0 0	1 3	Dec., 1896	1 7 6	1 10 0
St. John del Rey	Brazil	"	562,000	1 0 0	xn	Jan., 1895	13 9	16 3
Copper:								
Anaconda	Montana	Cop. & Sil.	6,000,000	5 0 0	5 1¾	Nov., 1896	5 18 9	6 1 3
Cape Copper	So. Africa	Copper	600,000	2 0 0	3 0	Dec. "	2 7 6	2 10 0
Copiapo	Chile	"	200,000	2 0 0	1 6	Dec. "	1 17 6	2 2 6
Mason & Barry	Portugal	Cop.& sulph	1,650,000	4 0 0	£1 cp	Dec. "	2 5 0	2 10 0
Rio Tinto	Spain	Copper	3,350,000	10 0 0	18 0	Nov., "	2½ 10 9	25 15 0
Tharsis	"	Sulpr &cop'r	1,250,000	2 0 0	4 0	April, "	5 17 6	6 2 6
Australians:								
Bayley's Reward	W.Au't'lia	Gold	180,000	1 0 0	0 4	Dec., 1894	2 9	3 3
Broken Hill Prop.	N.S.Wales	Silver	960,000	1 0 0	1 0	" 1896	2 10 0	2 12 6
Mt. Morgan Gold	Qu'ns and	Gold	1,000,000	1 0 0	0 6	" "	3 7 6	3 12 6
South Africans:								
British S.Africa Co	So. Africa	Lands &Ex.	2,500,000	1 0 0	xn.	Nov "	2 7 6	2 10 0
†City & Suburban	Transvaal	Gold	55,000	4 0 0	2 0	Oct., "	4 0 0	4 5 0
Crown Reef	"	"	180,000	1 0 0	12 0	" "	10 2 6	10 7 6
†De Beers	CapeCol'y	Diamonds	3,950,000	5 0 0	22 0	July, "	29 11 3	29 13 9
†Ferreira	Transvaal	Gold	90,000	1 0 0	25 0	Aug. "	18 10 0	19 0 0
Geldenhuis Est	"	"	200,000	1 0 0	2 6	Oct., "	3 0 0	3 5 0
†Henry Nourse	Witw'sr'd	"	100,000	1 0 0			6 10 0	6 15 0
†Heriots (New)	"	"	115,000	1 0 0	4 0	Oct., 1896	7 15 0	8 0 0
Jagersfontein	OrangeF.S	Diamonds	1,000,000	5 0 0	6 0	Sept. "	9 8 9	9 11 3
†Langlaagte Estate	Transvaal	Gold	500,000	1 0 0	3 0	July, "	4 5 0	4 10 0
Primrose (New)	"	"	280,000	1 0 0	xrts.	Sept. "	4 0 0	4 5 0
†Robinson	"	"	2,750,000	5 0 0	5 0	July, "	8 5 0	8 10 0
†Sheba	"	"	85,000	1 0 0	1 0	Sept., "	2 1 3	2 3 9
Sim. & Jack (New)	"	"	500,000	5 0 0			4 10 0	4 15 0
Wemmer	Witw'sr'd	"	55,000	1 0 0	10 0	Apr., 1895	7 7 6	7 12 6

†Dividend pending.

PARIS. Week ending Jan. 8.

NAME OF COMPANY.	Country.	Product.	Capital Stock.	Par value.	Divs. last year.	Prices. Op'ning.	Prices. Closing.
			Francs.	Fr.	Fr	Fr.	Fr.
Acieries de Creusot	France	Steel mfrs	27,000,000	2,000	100.00	1,865.00	1,89 0.00
" " Firminy	"	" "	3,000,000	500	85.00	1,79 .00	1 8 0.00
" " Fives-Lille	"	" "	12,000,000	500	35.00	770.00	790.00
" " la Marine	"	" "	30,000,000	500	37.50	995.00	1,0 0.00
" " Longwy	"	" "		500	35.00	85 .00	867.50
Aguas Tenidas	Spain	Iron pyrites	10,000,000	500	25.00	1 12.0	95 50
Anzin	France	Coal			170.50	4,660.00	4,700.00
Boleo	Lower Cal	Copper		500	65.00	1,365.00	1,3 5.00
Briansk	Russia	Coal & Iron				1,370.00	1,160.00
Bruay	France	Coal	3,000,000	400	700.00	24,000.00	25,5 0.00
Callao	Venezuela	Gold	32,200,000	125		4 50	4.5
Cape Copper	S. Africa	Copper		50	1.50	64.00	62.50
Champ d'Or	"	Gold		25		26 50	25 50
Courrieres	France	Coal	60,000	300	160.00	4,660.00	4,575.00
De Beers Consolidated	S. Africa	Diamonds	98,750,000	125	15.63	736.00	753.00
Dombrowa	Russia	Coal		500		560.00	560.00
Dynamite Centrale	France	Explosives		500	25.00	508.00	517.00
Fraser River	Brit. Col'mb	Gold				38.00	32.50
Huanchaca	Bolivia	Silver		125	5.00	80.50	70.00
Huta-Bankowa	Russia	Iron & steel				3,280 90	3,160.00
Langlaagte Estates	S. Africa	Gold	11,750,000	25	11.25	107.90	108.00
Laurium	Greece	Zinc & lead	16,300,000	500	40.00	669.00	669.0
Lautaro	Chile	Nitrates		125		150.00	148.00
Malfidano	Italy	Zinc	12,500,000	500	40 00	1,0.0.00	1,060.0
Metaux, Cie. Fran. de	France	Metal d'lers.	25,000,000	500	12.00	6 0.00	643.00
Mines d'Or de la Russie	Russia	Gold				1,010.00	1,010.00
Mokta-el-Hadid	Algeria	Iron	18,312,500	500	40.00	760.00	755.00
Nickel	N. Caled'nia	Nickel	14,720,000	500	30.00	162.00	195.00
Paccha-Jazpampa	Chile	Nitrates				15.00	15.00
Penarroya	Spain	Coal, etc		500	52.50	1,585.00	1,670.0
Rebecca	Colo'do,U.S.	Gold			6.50	7.00	6.50
Rio Tinto	Spain	Copper	31,250,000	250	27.65	630.00	651.00
Robinson	S. Africa	Gold		125	12.50	215 00	216.50
Saint Elie	Fr. Guiana	"	4,000,000	25		18.50	18.50
Salines de l'Est	France	Salt		500	27.00	295.30	300.00
Sels Gem.de la Rus. Mer	Russia	" etc				615.00	598.00
Tharsis	Spain	Copper		50	8.75	154.00	163.50
Vieille Montagne	Belgium	Zinc	9,000,000	80	20.00	515.00	537.00

MEXICO. Week ending Jan. 14.

NAME OF COMPANY.	State.	No. of shares.	Last dividend.	Last assessment.	Prices. Opening.	Prices. Closing.
Amistad y Concordia	Hidalgo	9,600	$0.7		$25	$30
Angustias	Guanajuato	2,400	10.00		410	400
Arevalo y Anexas	Hidalgo		10.00		220	300
Asturiana y Anexas	Zacatecas	2,500	10.00		320	250
Bartolome de Medina	Hidalgo	2,000	3.50		180	150
Carmen	"	1,100	7.75		350	400
Castellana y SanRam	Tepic	2,448	3.00		125	100
Cerro Colorado	Chihuahua	15,000		$1.00	10	10
Cinco Senores y An	Guanajuato	2,000	25.00		870	830
Concepcion y Anexas	S. Luis Potosi	2,700			180	100
El Oro	Guanajuato	500			80	60
Guadalupe	"	10,000	2.00		180	200
Luz de Maravillas	Hidalgo	1,100			120	150
Pabellon	"	1,000	27.89		200	180
Purisima de los Com.	Zacatecas	2,400			10	5
Real del Monte	Hidalgo	2,554	10.00		950	1,100
Rosario y Anexas	Durango	4,800			60	50
San Francisco	Hidalgo	2,000	3.00		280	290
S. Ped. Chalchihuites	"	1,000	2.00		100	80
San Rafael y Anexas	"	1,200	20.00		850	950
do. free stock	"	1,200	14.00		350	450
Sta. Maria de la Paz	S. Luis Potosi	2,400			190	325
Soledad	Hidalgo	960	7.50		400	450
Sorpresa	"	960	5.00		250	300
Trinidad	Guanajuato	2,000			60	50
Tlauzingo	Puebla	2,400			30	40
Union	Hidalgo	2,000	8.00		300	350
Zaragoza	"	1,100			15	15
Zomelahuacan (gold)	Vera Cruz	5,000			100	100
Zona Min. de Pozos	Guanajuato	2,400		1.50	30	40

NOTE.—In most Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Prices are in Mexican dollars.

VALPARAISO, CHILE.* Dec. 5.

NAME OF COMPANY.	Capital.	Share value Nominal	Share value Paid up.	Last Dividend.	Prices. Bid.	Prices. Asked.	Prices. Last sale
Arturo Prat	$3,300,000	$100	$100	0½ per cent.	$30	$32	$32
Caracoles	315,000	100	100	5 "	30	30	30
Descub. de Huantajaya	1,000,000	100	100	3 "			
Huanchaca de Bolivia	8,000,000	25	25	4 "	45½	46¼	46
Oruro	800,000	200	200		330	340	330
S. Agustin de Huantajaya	1,500,000	100	100	2½ per cent.			
Todos Santos	2,000,000	100	100	1 "	12	14	12
Nitrate Cos:							
Agua Santa	3,000,000	50	50	4 "	150	151	150
Antofagasta	2,000,000	200	200	5 "	150	151	150
Union	3,000,000	200	500		40	41	40

* Special Report of Jackson Bros. Values are in Chilean pesos or dollars.

SHANGHAI, CHINA.* Dec. 24.

NAME OF COMPANY.	Country.	No. of shares.	Value. Par.	Value. Paid up.	Last dividend. Date.	Last dividend. Amount.	Price.
Jelebu Mg. & Trad	China	45,000	$5	$5	Oct., 1894	$0.25	Taels 1.90
Punjom Mg. Co., Ltd.	"	60,000	4	3.75			" 9.49
do. pref	"	30,000	1	1			" 2.72
RaubA'lian G.Mg. Co.	"	200,000	£1	13s. 10d.	Dec., 1893	0.21	" 6.57
Sheridan Con.Mg. Co.	Colorado,U.S	20,000	Taels 100	Taels 100			" 4.00

* Special Report of J. P. Bissett & Co. The prices quoted are in Shanghai taels.

DENVER, COLO.*

NAME OF COMPANY.	Par val.	Jan 11 B.	Jan 11 A.	Jan. 12. B.	Jan. 12. A.	Jan. 13. B	Jan. 13. A.	Jan. 14. B.	Jan. 14. A.	Jan 15. B.	Jan 15. A.	Jan. 16 B.	Jan. 16 A.	Sales.
L'd Mines														
Anaconda	$5	.91	.92	.92½	.93	.90	.92	.90	.92	.90	.92	.90	.92	700
Bankers	1	.10¼	.10⅝	.09⅜	.10⅝	.10	.11	.09½	.10⅝	.09⅞	.10⅝	.09	.12	1,000
Gar.-Grouse	1	.08¼	.08⅜	.08⅜	.08⅜	.08½	.09	.09½		.09½	.09⅜	.09		43,500
Iron Clad	1	.07⅜	.07¼	.07	.07⅜	.07	.07⅝	.06⅞	.07¼	.06⅝	.07	.07	.07⅜	8,000
Isabella	1	.47	.47½	.50¼		.51	.51½	.54¼	.54⅝	.54⅜	.55½	.52½	.53	37,4 0
Jefferson	1	.13	.14¾	.13¾	.15	.12⅝	.15		.14	.15				200
Mollie Gib	1	.58			.61¾	.54	.64	.54	.59½	.50	.70			6.0
New Zeal		.04¾	.05¼	.04⅝	.05	.04	.05	.04	.05	.04⅝	.05	.04¼	.04⅝	1,000
List. Pr.														
Addie C	1	.06¼		.06⅝	.01	.007		.06¾	.007	.007	.07¼	.07¼	.09	17,000
Agate	1	.001¾	.001⅝	.001⅝	.001⅝	.001	.001¼	.001	.002	.001	.001⅝	.001	.01¼	3,000
Aola	1	.01⅝	.01¾	.01⅜	.01¾	.01⅝	.01¾	.01⅝	.01¾	.01⅜	.01¾	.01⅝	.01¾	5,0.0
Big Johnny	1													
Blue Jay	1	.002⅝	.003	.002½	.003	.002½	.02⅝	.02½	.02⅝	.002½	.002⅝	.002½	.02⅝	50,300
Cannon Ball	1	.004⅜	.0 5	.004		.004⅜	.005⅜	.004⅜	.005	.004⅜	.005	.004	.005⅜	2,000
Champ'gne	1	.05½	.007	.05	.007	.005	.0 5¼	.05	.01	.0 5½	.007	.05	.007	3,000
Defend r	1													
Dictator	1													
Dixie	1	.001⅜	.002	.01¼	.013⅜	.01⅜	.002	.001⅜	.001¾	.01¼	.001⅜		.002	3,000
Drexel	1													
Eclipse	1	.03¾	.04⅜	.03¾	.03	.003⅜	.04¼	.03⅜	.04¼	.003	.03¼	.03⅜	.004	1,00
Finance	1	.009¾	.01⅜	.0 5⅜	.01 ⅝	0.9¼	.11	0.9	.011	.0 9¾	.0 9½		.015	3,000
Forest R	1	.001⅜	.0 3	.01⅜	.02⅜	.01⅜	.01⅜			.001	.02⅜	.001	.0 2⅜	1,000
Gene Field		.002¼	.002¾	.002	.002⅝	.02¾	.0 2¾	.002¾	.02¾	.002¼	.02⅝	.002	.002⅜	15,000
Geo Wash.	1													
Gold Field	1	.003¾	.003⅜	.0 3¼	.003⅜	.0 3¾	.003¾	.003⅜	.003⅝	.003¾	.003¾	.003¾	.003⅜	7,000
Gold. Hope	1													
Gold Queen	1	.0 1⅜	.001¾	.001¾	.001⅝	.001¼	.01¾	.01¼	.001⅝	.01¾	.001⅝	.001	.001¾	74,0.0
Gregory														
Henrietta	1	.008⅜	.009	.0 8	.01			.007⅝	.0 9⅝	.0 8			.010	5,000
Illinois	1	.012	.012⅜	.01⅜	.0 5	.011¼	.011⅜	.010⅝	.011⅝	.010⅜	.011⅜	.010⅜	.011¼	51,0.0
Internat'l		.002¼	.003	.002	.003	.002	.004⅜	.002⅜	.00 ⅜	.002⅜	.0 4	.003⅜	.005	15,000
Justine														
Kimberly	1													
Millionaire			.002	.001	.002		.001⅜			.001	.003	.001	.002⅜	3,000
O dGregory	1													
Orient	1	.001	.001⅜	.001⅜	.001⅜	.01	.001⅜	.001	.001⅜	.001		.001	.001⅜	2,000
Pilgrim	1	.006	.007	.005	.006⅜	.005⅜	.008	.005⅜	.007⅜	.006	0 8	.005⅜	.006⅜	1,000
Puritan	1	.005	.0 5⅜	.0 4⅜	.006	.005	.007	.005	.006	.0 5		.005	.006⅜	5,000
Q'n Victoria	1	.0 4⅜	.0 6	.004¾	.005⅛	.004⅜	.005⅛	.004⅜	.005⅛	.005	.005⅛	.004⅜	.005	15,000
Reno	1	.01	.014⅜	.0 5⅝	.01⅜	.01⅛	.0 4⅛	.01⅜	.0 4⅛	.0 3⅝	.0 4⅛	.0 3⅝	.0 4⅜	9,000
Royal Age	1	.006	.006⅜	.006	.007	.005	.007	.006	.006⅜	.005⅛		.0 5⅜	.006	28,000
Senator	1	.002	.002⅜	.002	.003	.0 2	.003	.002⅛	.003	.002	.003	.002		4 000
Sentinel	1	.002⅜	.003	.0 1⅜	.003	.002⅜	.002⅜	.002⅜	.003	.002⅜	.003	.002⅜	.0 2⅜	1,000
Seven Hills	1	.003	.006⅜	.005⅜	.0 5	.0 5	.007⅜	.004⅛	.005			.003⅜	.005	2,0.0
Ind. Act.														
Ætna	1	.007	.007⅜	.0 7⅜	.008⅛	.008⅛		.01	.010⅛	.01 ⅛	.010⅛	.007⅛	.008	55,000
ArcadiaCon	1	.06⅜	.08	.06⅜	.07⅛	.06⅜	.07	.06⅜	.07⅛	.07⅛	08	.07⅜	.08⅛	1,0.0
Arg. J	1	43	.44	.41	.42⅜	41		.40		41⅜	.45	.44	.50	1,600
Bob Lee	1	.012⅛	.012⅜	.12	.012⅜	.0 2	.014	.012	.013⅜	.01	.014⅛	.011⅜	.012⅜	5,000
Bost. & C.C.	1	.008⅜	.009⅜	.008⅜	.02	.008⅛				.0 8⅜			.02	8,0.0
Chimbor'zo	1	.006⅜	.009	.007⅛	.007⅜	.007	.008	.006⅛	.0 7⅛	.0 6⅜	.01	.007	.0 8	1,0 0
C. C. & M.	1	03	.03⅜	03⅝	.03⅜	.03	.03⅛	.03⅛	.03⅛	.03	.03⅛	.02⅜	.03⅝	2,000
C. C. Con	1													
Elkton	1	1.06				1 25	1.35	1 26	1.35	1.26⅛	1.29			1,200
Enterprise	1													
Goldsmith	1													
Jack Pot	1	06	.07	.03¼	.06⅜	.06⅛	.07⅜	.06⅜	.07	.06⅜	.06⅜	.06⅜	.07⅛	2,000
Lit. Dorrit	1	.0 2⅜	.00 ¾			.002⅜		.002⅜						21, 00
Mt. Beauty	1	.02⅛	.0 2⅜					.0 2⅜		.0 2⅜	.02⅜	.02⅛	.0 2⅜	6,000
Old Gold	1	.007	.007⅜	.007	.007⅛	.007⅛	.007⅜	.005⅜	.008⅛	.008⅜	.0 9	.008⅛	.008⅜	214,500
Portland	1													
Santa Fe	1													
Tamarack	1	.02⅛	.02¼	.02⅛	.02¼	.02⅛	.02¼	.02¼	.0 2⅜	.02¼	.02¼	.02¼	.02¼	131,0 0
Union Gold	1	.31½	.32	.31⅝	.32	.3 ⅜	.32	.30⅜	.3 ⅜	.30⅜	.31	.32⅛	1,800	
Va. M.	1	.04½	.04⅝	.04⅛	.04⅜	.04⅝	.04⅜	.04⅛	.04⅝	.03⅞	.05¼	.03⅜	.05⅛	117,000
Wire Gold	1			.01¼	.03	.01⅛	.03	.01	.03					10,000

* Official quotations Colorado Mining Stock Exchange.
Shares sold, listed, 412,4 0; unlisted, 5?8 10?. Total, 99?,5?0.

SALT LAKE CITY, UTAH.* Week ending Jan 16.

STOCKS.†	Par value.	Bid.	Asked.	Actual selling price.	STOCKS.†	Par value	Bid.	Asked.	Actual selling price.
Ajax	$10	$0.89	$0.90	$0.90	Horn Silver	$25	$1.25	$2.00	
Alliance	1	.15	.30		Little Pittsburg		.01¾	.02	.01¾
Annie		.05	.08		Lucky Bill		.22½	.25	25
Am. Nat. Gas					Malvern		.21	.23	
Anchor	25	1.20	2.00		Mammoth	25	2.40	2.50	2.45
Bogan	1	.05	.12½		Mercur	25	6.20	7 35	7.30
Brick Con		.35	.50		Morgan	125	.10	.25	
Bullion Beck & C.	10	6.85	7.25	7.15	Northern Light		.95	1.00	.96
Centen'l Eureka	50	65.00			Ontario	100	9.25	10.25	10.00
Dalton	5	.02½	.03	.02½	Overland		.20	.30	
Dalton & Lark		.20	.25	.23	Rover	10	.35	.50	.45
Daly	20	4.90	5.50	5.25	Silver King	20	16.00	18.00	17.00
Daly West	20	7.90	8.15	8.00	Sioux Con	10	.80	1.00	
Eagle	10	.03	.06		Sunshine	10	.75	1.00	.75
East Golden Gate					Swansea		2.35	2.50	2.40
Four Aces		.18	.30	.18½	Sc. Swansea		1.75	1.85	1.75
Galena	10	1.20	1.40	1.30	Tetro	1	.03¾	.07½	
Geyser		.80	.90	.90	Utah		.95	1.20	1.05
Herschel		.08	10		Utah Con	1	.50	.85	

* Special Report of James A. Pollock. † All the companies are located in Utah.

PHILADELPHIA PA.*

NAME OF COMPANY.	L'cation.	Par Val'e	Jan. 14. H.	Jan. 14. L.	Jan. 15. H.	Jan. 15. L.	Jan. 16. H.	Jan. 16. L.	Jan. 18. H.	Jan. 18. L.	Jan. 19. H.	Jan. 19. L.	Jan. 20 H.	Jan. 20 L.	Sales
Cambria Iron	Pa.								45.25	45 00	45 50	45 00	45.38	45.00	622
Choc.&Glf.Ctfs	I.T.	50	8.25	7 75	8 13	8.00			8.00		8 00				4,250
Hunt & Br.Top	Pa.	50											23 00		10
" pref	"	50											50.00		10
Lehigh C. & N.	"	50	42 00	41.00	42 00	41.00	42.00	41 00	42 00	41.00	41.50		40.00		136
Lehigh Valley	"	50	30 50	30.13	30.75	30.25	30.38	30 13	30 50	30.00	30.25	30 00	30.13	30.00	4 202
Li'leschuylkill	"	50									51.25	51.00			15
Penna. R. R.	"	50	52.25	52.00	52.25	52.13	52.50	52.25	52.50		52 63	52.50	52.63		2,538
Pa Salt Mfg Co.	"	50			100						103¾				17
Penna. Steel	"				30.0	29.75	30.0		31.50	30 00					39
UnitedGas Im	Can.		72.38	72.25	72.50		73.25	72.50			73.50	73.00	73.50	73.25	932
Welsb.of Can	Pa.								2 13	2.00	2.13		2.25		801
Welsb Com'l	"								23.0						25
" Com pr.	"		63.00						65.00		67 5	67.0			255
" Light	"		45.5	45.00			45.60		46 50		47.00	46.50	45.88		284
West Coal	"								48.00						43

* Official quotations Philadelphia Stock Exchange. Total sales, 14,198.

HELENA, MONT.* Week ending Jan. 9.

NAME OF COMPANY.	Location.	Company's office.	Par value.	Bid.	Asked	Shares sold.	Price.
Am.Dev.&M.Co.	Mont. & Idaho	Butte, Mont.	$1		$1.25		
Bald Butte	L. & Cl'ke Co.	Helena "	1		2 00		
Bi-Metallic	Granite "	St. Louis, Mo.	5		1 75		
Combination	" "	" "	10		.50		
Granite Mt	" "	" "					
Helena & Victor	Missoula "	Helena, Mont.	5		.15		
High Ore	Jefferson "	Butte "					
Iron Mountain	Missoula "	Helena "	10	.42	.45	1,500	.42½
Judge	Meagher "	" "		.09	.10	2,500	.10
Merrill (Gold)	Jefferson "	Butte "	1				
Ontario	DeerLodge "	Helena "	1				
Yellowstone	Meagher "	" "	5	.12½	.15		

* Special Report of Samuel K. Davis. Total shares sold, 3,700.

PITTSBURQ, PA.* Week ending Jan. 16.

NAME OF COMPANY.	Location.	Par val	Bid.	Ask.	Selling price.	NAME OF COMPANY.	Location.	Par val	Bid.	Ask.	Selling price.
COAL:						NAT. GAS:					
Mansfield	Pa.	50				Allegheny	Pa.	100			
N.Y. & C. Gas C.	"	50				Chartiers Val	"	100			
MINING:						Manufacturers	"	100			
Ent'prise	Colo.	5				Peoples' Nat. Gas	"	50			
Lustre	Mex.	10	⅞	10		Peoples' Pipeage	"	50	13	14	
Silverton	Colo.	10				Pennsylvania	"	50	5½	5¾	
MISCELLANEOUS:						Philadelphia	"	50	16¾	17	
Carborundum	Pa.	100				Wheeling	W.V.	50	18	19	

* Official quotations Pittsburg Stock Exchange.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Assessments. Total Levied.	Assessments. Date and Amount of Last.			Dividends. Total Paid.	Dividends. Date and Amount of Last.		
1	Adams, s. l. c.	Colo.	$1,500,000	150,000	$10	*				$693,500	Oct.	1895	.04
2	Ætna Cons., q.	Cal.	500,000	100,000	5	*				80,000	Dec.	1896	.10
3	Alaska-Mexican, g.	Alask	1,000,000	200,000	5					173,031	Oct.	1896	.10
4	Alaska-Treadwell, g.	Alask	5,000,000	200,000	25	*				3,025,000	Oct.	1896	.37½
5	Anaconda Copper.	Mont.	30,000,000	1,200,000	25					2,250,000	Nov.	1896	1.25
6	Anchoria-Leland, g.	Colo.	600,000	600,000	1	*				30,000	Dec.	1896	.01
7	Argentum Juniata, g.s.l	Colo.	2,600,000	1,300,000	2	*				156,000	Oct.	1895	.03
8	Aspen Mg. & S., s. l.	Colo.	2,000,000	200,000	10	*				900,000	July	1894	.10
9	Atlantic, c.	Mich.	1,000,000	40,000	25					700,000	Feb.	1891	1.60
10	Aurora, i.	Mich.	2,500,000	100,000	25	*				700,000	April	1896	.50
11	Bald Butte	Mont.	250,000	250,000	1	*				470,000	June	1896	.03
12	Bangkok-Cora Bell, s. l.	Colo.	600,000	600,000	1					107,510	July	1896	.01
13	Bates Hunter, g. s.	Colo.	1,000,000	1,000,000	1	*				67,500	Dec.	1891	.00¾
14	Belden, F. E., m.	N. H.	500,000	100,000	5	*				217,000	Jan.	1896	.04
15	Big Six, g. s.	Colo.	500,000	500,000	1					2,500	May.	1896	.00½
16	Bi-Metallic, g. s.	Mont.	5,000,000	200,000	25	*				1,630,000	June	1893	.10
17	Bodie Cons., g. s.	Cal.	10,000,000	100,000	100	$716,490	April.	1896	.15	1,677,572	Dec.	1894	.25
18	Boston & M. Cons., g.s.c	Mont.	3,750,000	150,000	25	*				4,925,000	Nov.	1896	3.00
19	Brotherton, i.	Mich.	2,000,000	80,000	25	*				120,000	Mar.	1893	.50
20	Bullion, Beck & Champ.	Utah.	1,000,000	100,000	10	*				1,947,000	Dec.	1896	.45
21	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25					46,850,000	Dec.	1896	5.00
22	Cariboo	B.C.	800,000	800,000	1					125,410	Dec.	1896	.02
23	Centen'l-Eureka, g.s.l.c	Utah.	1,500,000	30,000	50	30,000	Mar.	1889	1.00	1,860,000	Dec.	1896	1.00
24	Central, c.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65	1,970,000	Feb.	1891	1.00
25	Charleston, p. r.	S. C.	1,000,000	10,000	100	*				140,000	Dec.	1893	2.50
26	Clay County, g. s. c.	Colo.	60,000	60,000	1	*				52,000	Nov.	1891	.02
27	C. O. D., g.	Colo.	500,000	500,000	1	*				25,000	Mar.	1896	.01
28	Cœur d'Alene, s. l.	Idaho	5,000,000	500,000	10					340,000	June	1893	.06
29	‡Cons. Cal. & Va., g. s.	Nev.	21,600,000	216,000	100	4,960,130	Jan.	1897	.25	3,898,800	Feb.	1895	.25
30	Cons. New York, g. s.	Nev.	10,000,000	100,000	100	168,000	Jan.	1896	.05	10,000	Feb.	1893	.10
31	Coptis, g. s.	Nev.	10,000,000	100,000	100					77,000	Feb.	1895	.01
32	Cortez, Ltd., s. g.	Nev.	1,500,000	300,000	5					735,000	Feb.	1893	.15
33	Dalton & Lark, s. l.	Utah.	2,500,000	2,500,000	1					87,500	Aug.	1896	.00½
34	Daly, s. l.	Utah.	3,000,000	150,000	20					2,887,500	Aug.	1896	.25
35	†Deadwood-Terra, g.	S. D.	5,000,000	200,000	25	*				1,240,000	Aug.	1896	.50
36	De Lamar, g. s.	Idaho	2,000,000	400,000	5	*				2,194,000	Oct.	1896	.25
37	Derbec Blue Gravel, g.	Cal.	10,000,000	100,000	100	110,000	June.	1893	.10	280,000	Aug.	1891	.10
38	Dexter, g. s.	Nev.	1,000,000	100,000	10	8,000	June.	1892	.08	100,000	Aug.	1893	.33
39	Elkton Cons., g.	Colo.	1,250,000	1,250,000	1					166,960	Dec.	1896	.02
40	Elkhorn, s.	Mont.	1,000,000	200,000	5					1,212,000	June	1895	.06
41	Enterprise, g. s.	Colo.	2,500,000	500,000	5	*				825,000	May	1893	.25
42	Eureka Cons., g. s. l.	Nev.	1,000,000	50,000	20	555,000	July.	1896	.10	5,112,500	Jan.	1892	.25
43	Evening Star, s. l.	Colo.	500,000	50,000	10	*				1,437,500	Dec.	1889	.25
44	Florence, s.	Mont.	2,500,000	500,000	5	*				89,348	May.	1896	.02
45	Franklin, c.	Mich.	1,000,000	40,000	25					1,240,000	Jan.	1894	2.00
46	Galena, g. s. l.	Utah.	1,000,000	100,000	10					61,000	Nov.	1896	.65
47	Garfield-Grouse, g.	Colo.	1,200,000	1,200,000	1	*				24,000	Dec.	1896	.01
48	Gold Coin, g. s.	Colo.	1,000,000	200,000	5	*				100,000	Nov.	1896	.10
49	Golden Eagle, g.	Colo.	1,000,000	1,000,000	1	*				10,000	Sept.	1896	.01
50	Golden Fleece, g. s.	Colo.	600,000	600,000	1	*				563,179	Dec.	1896	.01
51	Gold & Globe, g.	Colo.	750,000	750,000	1					28,875	June.	1896	.00 3/10
52	Gold Rock, g. s. c.	Colo.	500,000	500,000	1	*				28,750	Dec.	1891	.01
53	Granite Mountain, g. s.	Mont.	10,000,000	400,000	25	*				12,120,000	July.	1892	.20
54	Granite, s. l.	Idaho	500,000	200,000	2.50	*				83,400	Nov.	1890	.10
55	Gt. West'n Quicksilv., q.	Cal.	5,000,000	50,000	100					388,366	Nov.	1893	.10
56	Harquahala, g.	Ariz.	1,500,000	300,000	5					126,000	Nov.	1894	.12
57	Hecla Cons., g. s. c. l.	Mont.	1,500,000	30,000	50	*				2,145,000	Dec.	1896	.50
58	Helena & Frisco, s. l.	Idaho	2,500,000	500,000	5	*				475,000	Aug.	1896	.04
59	Holmes, s.	Nev.	10,000,000	100,000	100	345,000	Mar.	1880	.25	75,000	April	1892	.25
60	Homestake, g.	S. D.	12,500,000	125,000	100	200,000	July.	1878	1.00	6,087,500	Dec.	1896	.25
61	Hope, s.	Mont.	1,000,000	100,000	10	*				652,252	Dec.	1896	.10
62	Horn-Silver, g. s. c. sp. l.	Utah.	10,000,000	400,000	25	*				5,130,000	Jan.	1896	.12½
63	Iowa	Colo.	1,000,000	1,000,000	1					60,000	Dec.	1896	.01
64	Iron Mountain, s. l.	Mont.	5,000,000	500,000	10	*				492,500	Nov.	1896	.06
65	Iron Silver, s. l.	Colo.	10,000,000	500,000	20	*				2,500,000	April	1889	.20
66	Isabella, g.	Colo.	2,250,000	2,250,000	1					262,500	Sept.	1896	.01
67	Jack Rabbit, g.	Cal.	10,000,000	100,000	100	118,000	April.	1894	.02	260,000	April.	1891	.10
68	Jay Hawk, g.	Mont.	1,425,000	285,000	5					33,375	Dec.	1892	.12
69	Kearsarge, c.	Mich.	1,000,000	40,000	25	190,000	Oct.	1887	1.00	120,000	Dec.	1895	1.00
70	Kennedy, g.	Cal.	10,000,000	100,000	100					1,796,000	Aug.	1895	.48
71	Leadville Cons., s. l.	Colo.	4,000,000	400,000	10	*				316,000	Feb.	1893	.03
72	Little Chief, s. l. i-o.	Colo.	10,000,000	200,000	50	*				820,000	Dec.	1890	.05
73	Maid of Erin, g. s. c. l.	Colo.	3,000,000	600,000	5	*				740,000	Nov.	1895	.02
74	Mammoth, g. s. c.	Utah.	10,000,000	400,000	25	*				1,150,000	Nov.	1896	.05
75	Mayflower Gravel, g.	Cal.	1,200,000	60,000	20					166,897	Dec.	1895	.10
76	May-Mazeppa Con., l. s.	Colo.	1,000,000	1,000,000	1	*				170,000	Oct.	1891	.03¾
77	Mercur, g.	Utah.	5,000,000	200,000	25	*				575,000	Dec.	1896	.12½
78	Minnesota Iron, i.	Minn.	16,500,000	165,000	100	*				3,240,009	July.	1896	1.50
79	Mollie Gibson, s.	Colo.	5,000,000	1,000,000	5	20,000	Jan.	1891	.02	4,080,000	Jan.	1895	.05
80	Monitor, g.	S. D.	2,500,000	500,000	10					45,000	Oct.	1890	.03
81	Montana, Ltd., g. s.	Mont.	3,300,000	660,000	5	*				2,890 637	Oct.	1895	.06¼
82	Montana Ore Purchas'g	Mont.	1,000,000	40,000	25	*				520,000	Jan.	1897	1.00
83	Moon Anchor Gold.		600,000	600,000	1	*				24,000	July.	1896	.01
84	Moose, g.	Colo.	600,000	600,000	1					186,000	Jan.	1896	.01
85	Morning Star Cons., s. l.	Colo.	1,000,000	100,000	10	*				1,025,000	Dec.	1891	.25
86	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	145,000	Nov.	1896	.10	225,000	Aug.	1893	.25
87	Mt. McClellan, g. s. l.	Colo.	1,250,000	250,000	5	*				21,936	June.	1891	.03
88	Mt. Rosa, g.	Colo.	1,000,000	1,000,000	1					30,000	Oct.	1896	.00½
89	Napa, q.	Cal.	700,000	100,000	7	*				820,000	Jan.	1897	.10
90	New Elkhorn	Colo.	1,500,000	300,000	5					72,000	Sept.	1896	.24
91	New Guston, g. s. c.	Colo.	550,000	110,000	5	*				1,198,120	Oct.	1892	.25
92	New Hoover Hill, g.	N. C.	300,000	120,000	2.50	*				22,500	Dec.	1885	.20
93	North Banner, g. s.	Cal.	1,000,000	100,000	10	21,794	Oct.	1896	.02	20,000	July.	1891	.05
94	North Com'wealth, s.	Nev.	10,000,000	100,000	100	85,000	April.	1890	.25	25,000	June.	1891	.25
95	North Star, g.	Cal.	2,000,000	200,000	10	20,000	June.	1885	.02	450,000	June.	1893	.50
96	Nugget, g.	Colo.	1,000,000	1,000,000	1	*				10,000	Jan.	1895	.00½
97	Ontario, s. l.	Utah.	15,000,000	150,000	100					13,355,000	Dec.	1896	.10
98	Osceola, c.	Mich.	1,250,000	50,000	25	*				2,122,500	Feb.	1897	1.00
99	Pacific Coast Borax, b.	Cal.	2,000,000	20,000	100					422,500	July.	1893	1.00
100	Parrot, c.	Mont.	2,300,000	230,000	10	*				1,622,215	June.	1894	.05
101	Petro, s.	Utah.	1,000,000	10,000	100					17,500	July.	1891	.75
102	Pharmacist, g.	Colo.	1,200,000	1,200,000	1					80,000	Jan.	1893	.01
103	Portland, g.	Colo.	3,000,000	3,000,000	1	*				863,000	Dec.	1896	.01
104	Quicksilver, pref., q.	Cal.	4,300,000	43,000	100	*				1,823,911	June.	1891	1.25
105	" com., q.	Cal.	5,700,000	57,000	100	*				643,867	July.	1882	.40
106	Quincy, c.	Mich.	1,250,000	50,000	25	*				8,670,000	Dec.	1896	6.00
107	Reed National, s.	Colo.	500,000	500,000	1	*				45,000	Dec.	1890	.01
108	Robinson Cons., s. l.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
109	Running Lode, g. s. l.	Colo.	1,000,000	1,000,000	1	*				27,000	June.	1893	.00 1/10
110	St. Joseph, l.	Mo.	2,500,000	250,000	10					2,524,000	Dec.	1895	.25
111	Silent Friend, g. s. l.	Colo.	500,000	500,000	1	*				60,000	Aug.	1891	.25
112	Silver King, s.	Ariz.	10,000,000	100,000	100	247,858	Dec.	1896	.25	1,950,000	July	1887	.25
113	Silver King, g. s. l.	Utah.	3,000,000	150,000	20	3,000	Jan.	1897	.02	825,000	Nov.	1896	.25
114	Silver Mg. of L. V., s.	N. M.	500,000	500,000	1	*				300,137	Dec.	1891	.04
115	Small Hopes, s.	Colo.	5,000,000	250,000	20	*				3,275,000	Mar.	1896	.10
116	Smuggler Union	Colo.	5,000,000	50,000	100					100,000	July.	1896	1.00
117	Standard Cons., g. s.	Cal.	10,000,000	100,000	100					3,771,160	June.	1895	.10
118	Swansea, g. s. l.	Colo.	600,000	60,000	10	*				39,000	Sept.	1892	.10
119	Tamarack, c.	Mich.	1,250,000	50,000	25					4,770,000	Dec.	1896	3.00
120	Teal & Poe, s. l.	N. M.	150,000	150,000	1	*				9,000	Nov.	1891	.01½
121	Tom Boy, g.	Colo.	2,000,000	200,000	10	*				410,000	Mar.	1896	.20
122	Trinity River, g.	Cal.	500,000	500,000	1	*				15,000	July.	1893	.00½
123	United Verde, c.	Ariz.	3,000,000	300,000	10	*				562,500	Dec.	1893	.25
124	Union, g.	Colo.	1,250,000	1,250,000	1					73,000	June.	1896	.01
125	Union Leasing.	Colo.	500,000	500,000	1					340,000	July.	1895	.04
126	Utah	Utah.	1,000,000	100,000	10	*				175,000	Nov.	1896	.02
127	Victor, g.	Colo.	1,000,000	200,000	5	*				705,000	Dec.	1896	.10
128	War Eagle	B.C.	500,000	500,000	1	32,500	Dec.	1894		187,000	Oct.	1896	.06
129	Woodside	Utah.	1,000,000	100,000	10					25,000	Oct.	1889	.25
130	Yankee Girl, s.	Colo.	1,300,000	260,000	5					520,000	July.	1891	.25

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Assessments. Total Levied.	Assessments. Date and Amount of Last.		
1	Ada Cons., s. l.	Utah.	$100,000	100,000	$1	$3,333	Nov.	1895	.01½
2	Ajax, g.	Colo.	1,000,000	1,000,000	1				
3	Alamo, g.	Colo.	1,000,000	1,000,000	1				
4	Alice, g. s. c.	Colo.	5,000,000	5,000,000	1	*			
5	Alliance, g. s. l.	Utah.	100,000	100,000	1	200,000	Dec.	1895	.10
6	Allouez, c.	Mich.	2,000,000	80,000	25	1,440,937	June.	1894	.20
7	Alpha Cons., g. s.	Nev.	10,500,000	105,000	100	257,500	Sept.	1896	.10
8	Alta, s.	Nev.	10,080,000	108,000	100	3,590,560	Jan.	1897	.10
9	American, c.	Idaho	5,000,000	500,000	10	*			
10	American Belle, g.s.c.	Colo.	2,000,000	400,000	5	*			
11	Anaconda, g.	Colo.	5,000,000	1,000,000	5				
12	Anchor, g. s. l.	Utah.	1,500,000	150,000	10	560,000	Aug.	1893	.20
13	Aola, g.	Colo.	1,000,000	1,000,000	1	*			
14	Argonaut Cons., g. s.	Colo.	1,000,000	1,000,000	1	*			
15	Atlantic Cable Cons.	Colo.	1,500,000	1,500,000	1	*			
16	Bahama, g.	S. D.	1,250,000	250,000	5	3,125	Sept.	1893	.00¼
17	Bankers, g.	Colo.	1,250,000	1,250,000	1	*			
18	Belcher, s. g.	Nev.	10,400,000	104,000	100	3,312,420	Sept.	1896	.25
19	Belle Isle	Nev.	10,000,000	100,000	100	240,271	July.	1896	.10
20	Ben Hur, g.	Colo.	900,000	900,000	1				
21	Blue Bell, g.	Colo.	500,000	500,000	1	*			
22	Blue Jay Cons., s. l.	Utah.	2,000,000	400,000	5	4,750	July.	1893	.004
23	Bob Lee, g.	Colo.	1,200,000	1,200,000	1	*			
24	Bullion, s. g.	Nev.	1,000,000	100,000	100	3,030,000	Sept.	1896	.10
25	Bunker Hill & S., s. l.	Idaho	3,000,000	300,000	10				
26	Burlington, g. s.	Cal.	10,000,000	100,000	100	3,000	May.	1896	.03
27	Buskhorn, g.	Colo.	900,000	900,000	1				
28	Butte Queen, g.	Cal.	1,000,000	100,000	10	16,000	Feb.	1893	.10
29	Calumet, g.	Colo.	1,400,000	1,400,000	1	*			
30	Central Lead, l.	Mo.	400,000	4,000	100	*			
31	Central North Star, g.	Cal.	1,000,000	100,000	10	10,000	July.	1893	.10
32	Challenge, s. g.	Nev.	5,000,000	50,000	100	300 000	Nov.	1896	.10
33	Chollar, g. s.	Nev.	11,200,000	112,000	100	2,021,600	July.	1896	.25
34	Chrysolite, s. l.	Colo.	10,000,000	200,000	50	*			
35	Cleveland Cliffs, l.	Mich.	5,000,000	50,000	100	*			
36	Columbine, g.	Colo.	1,000,000	1,000,000	1	*			
37	Confidence, g. s.	Nev.	2,496,000	24,960	100	1,636,974	Sept.	1896	.30
38	Cons. Imperial, g. s.	Nev.	5,000,000	50,000	100	2,082,000	Aug.	1896	.01
39	Copper Mountain, g.	Colo.	1,000,000	1,000,000	1	*			
40	Creede & C. C., g.	Colo.	800,000	800,000	1				
41	CrippleCreekCons., g.	Colo.	2,000,000	2,000,000	1				
42	Crip. Cr'k Gold Expl'n	Colo.	1,800,000	1,800,000	1				
43	Dante, g.	Colo.	1,250,000	1,250,000	1	*			
44	Denver City, s.	Colo.	5,000,000	500,000	10	*			
45	Denver Gold, g.	Colo.	300,000	60,000	5				
46	Dickens-Custer, g. s.	Colo.	2,100,000	420,000	5				
47	Enterprise, g.	Colo.	800,000	800,000	1				
48	Eureka Con. Drift, g.	Colo.	500,000	500,000	1	90,000	Oct.	1892	.07
49	Exchequer, g. s.	Nev.	10,000,000	100,000	100	725,000	Dec.	1896	.05
50	Favorite, g.	Colo.	1,200,000	1,200,000	1	*			
51	Fortunatus, g. s.	Colo.	100,000	100,000	1	*			
52	Found Treasure, g. s.	Nev.	10,000,000	100,000	100	55,770	Jan.	1892	.50
53	Franklin Gold, g.	Colo.	1,000,000	1,000,000	1	*			
54	Free Coinage, g.	Colo.	1,000,000	1,000,000	1	*			
55	Galena, l. s.	Idaho	500,000	500,000	1				
56	Garden City, g.	S. D.	2,500,000	250,000	10	2,898	Sept.	1891	.00½
57	Gem, g.	Cal.	10,000,000	100,000	100				
58	Gold Belt, g. s.	Utah.	500,000	500,000	1	3,012	July.	1896	.00⅛
59	Golden Age, g.	Colo.	1,000,000	1,000,000	1	*			
60	Golden Dale, g.	Colo.	2,000,000	2,000,000	1	*			
61	Golden Fleece Grav. g	Cal.	130,000	130	1000	56,000	Aug.	1892	2.00
62	Gold Flat, g.	Cal.	1,000,000	100,000	10	13,000	Aug.	1893	.03
63	Gold King, g.	Colo.	1,000,000	1,000,000	1	*			
64	Gold Rock, g.	Colo.	1,000,000	1,000,000	1	*			
65	Gold Standard, g.	Colo.	1,000,000	1,000,000	1	*			
66	Gould & Curry	Nev.	10,800,000	108,000	100	4,850,400	Jan.	1897	.15
67	Hale & Norcross, g. s.	Nev.	11,200,000	112,000	100	5,780,800	Jan.	1897	.25
68	Hartshorn, g. s.	S. D.	1,250,000	250,000	5	8,750	Sept.	1891	.00½
69	Head Cent. & Tr., g. s.	Ariz.	2,000,000	200,000	10	22,824	Mar.	1892	.03
70	Hidden Treas., g. s.	Cal.	20,000	20,000	1	1,000	Nov.	1893	.05
71	Himalaya, s. l.	Utah.	1,800,000	180,000	10	10,000	Oct.	1892	.01
72	Idaho Co., Ltd., g.	Idaho	100,000	1,000	100	*			
73	Idlewild, g.	Cal.	1,000,000	100,000	10	*			
74	Inez, s. l.	Idaho	1,000,000	1,000,000	1	*			
75	Jack Pot, g.	Colo.	1,250,000	1,250,000	1				
76	Jackson, l.	Mich.	300,000	12,000	25	*			
77	Justice, g. s. c.	Colo.	500,000	500,000	1	*			
78	Keystone, g.	Colo.	1,500,000	1,500,000	1	*			
79	Kingman Silver, g. s.	Ariz.	10,000,000	100,000	100	5,000	Sept.	1891	.05
80	Lacrosse, g.	Colo.	1,000,000	100,000	10	*			
81	Lottie Gibson, g.	Colo.	1,000,000	1,000,000	1				
82	Matoa, g.	Colo.	5,000,000	1,000,000	5				
83	Mayflower, g.	Colo.	1,000,000	1,000,000	1	*			
84	Mexican, g. s.	Nev.	10,080,000	100,800	100	3,084,080	Nov.	1896	.20
85	Michigan Gold., g. s.	Mich.	2,500,000	100,000	25	40,000	Mar.	1892	.10
86	Milwaukee, s. l.	Idaho	500,000	500,000	1				
87	Modoc Chief, g. s. l.	Idaho	1,000,000	200,000	5	4,375	Jan.	1892	.00½
88	Monarch, g.	Colo.	1,000,000	1,000,000	1				
89	Mutual, g.	Colo.	500,000	500,000	1				
90	Neath, g.	Colo	1,000,000	100,000	10				
91	New Gold Hill.	N. C.	1,750,000	350,000	5				
92	New Viola, s. l.	Idaho	750,000	150,000	5	*			
93	North Belle Isle, s.	Nev.	10,000,000	100,000	100	523,074	July.	1896	.10
94	Occidental Cons., g. s.	Nev.	10,000,000	100,000	100	453,652	Dec.	1896	.15
95	Original Keystone, s.	Nev.	10,000,000	100,000	100	250,000	Mar.	1892	.10
96	Oro Cache, g. s.	S. D.	1,250,000	250,000	5	6,250	July.	1893	.00½
97	Orphal Bell, g.	Colo.	1,000,000	1,000,000	1				
98	Overman Silver, g. s.	Nev.	1,152,000	115,200	100	4,188,560	Dec.	1896	.10
99	Pappoose, g.	Colo.	2,000,000	2,000,000	1	*			
100	Peer, s.	Ariz.	10,000,000	100,000	100	215,000	July.	1894	.05
101	Peerless, s.	Nev.	10,000,000	100,000	100	410,000	July.	1894	.05
102	Pine Hill, g.	Cal.	1,000,000	100,000	10	20,000	July.	1896	.05
103	Pioche Con., g. s. l.	Nev.	20,000,000	2,000,000	10	*			
104	Potosi, g. s.	Nev.	11,200,000	112,000	100	2,021,600	Nov.	1896	.05
105	Princess, g.	Colo.	1,000,000	1,000,000	1				
106	Puritan, g. s.	Colo.	1,500,000	150,000	10	*			
107	Quincy, c.	Colo.	3,000,000	300,000	10				
108	Red Mountain, s.	Colo.	300,000	60,000	5	22,500	Mar.	1891	.12½
109	Ruby & Dun., g. s. l.	Nev.	25,300	506	25	*			
110	St. Mary, c.	Mich.	1,000,000	40,000	25	4,000	July.	1895	.05
111	Savage, g. s.	Nev.	11,200,000	112,000	100	1,051,400	Jan.	1897	.20
112	Seg. Belcher & M., g. s.	Nev.	10,000,000	100,000	100	340,000	Nov.	1896	.10
113	Silver Age, g. s. l.	Colo.	2,000,000	200,000	10	*			
114	Silver Hill, s.	Nev.	10,800,000	108,000	100	1,992,600	July.	1894	.05
115	Silver Queen, c.	Ariz.	5,000,000	200,000	25	*			
116	Silver State, g.	Colo.	700,000	700,000	1	*			
117	Siskiyou Con., s.	Cal.	2,000,000	200,000	10	44,000	June.	1896	.01
118	Specimen, g.	Colo.	1,200,000	1,200,000	1				
119	Temonj, g.	Colo.	1,000,000	1,000,000	1				
120	Tombstone, g. s. l.	Ariz.	12,500,000	500,000	25	*			
121	Tornado Con., g. s.	Nev.	100,000	100,000	1	*			
122	Union Con., g. s.	Nev.	10,000,000	100,000	100	2,345,000	Sept.	1896	.20
123	Utah Cons., s.	Nev.	10,000,000	100,000	100	415,722	Oct.	1896	.05
124	Victory, g. s.	S. D.	1,250,000	250,000	5	2,625	Nov.	1896	.00½
125	Virginia M. Cons., g.	Colo.	1,000,000	1,000 000	1				
126	Waterloo, g.	Cal.	2,000,000	200,000	10	30,000	Aug.	1893	.15
127	West Granite Mt., s.	Mont.	500,000	100,000	5				
128	Whale, g. s. l.	Colo.	500,000	500,000	1	*			
129	Work, g.	Colo.	1,250,000	1,250,000	1				
130	World, g.	Colo.	1,500,000	1,500,000	1	*			

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. †The Deadwood previously paid $275,000 in eleven dividends and the Terra $75,000.
‡ Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends and the Cons. Virginia $42,390,000. ‖ Dividends paid since consolidation.
NOTE.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.